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ORIGINAL ARTICLES.

STOMACH VERTIGO.*

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AS THE diagnosis of stomach vertigo is uncertain at best, and in view of the fact that the literature upon the subject appears at infrequent intervals, it would seem advisable before entering upon this discussion, to enumerate the principal characteristics of this form of vertigo, as described by Trousseau. According to this authority, they appear to be the following: there is no loss of consciousness and the patient never misunderstands the nature of his hallucinations; great fear attends the attacks; vision may be affected, objects may appear in a variety of colors, or all objects may revolve with excessive rapidity; pressure sensations may exist in the head and this form of vertigo does not occur when the head is lowered. The gastric symptoms described by Trousseau consist of pain in the epigastrium which upon pressure may radiate to the thorax, back, or even the extremities, and burning sensations within the stomach. Constipation exists as a rule, but there may be diarrhea. The attacks occur usually when the stomach is empty and may be relieved by taking food, or they may occur immediately after meals. At times all dyspeptic symptoms are absent.

It has appeared necessary to enumerate these principal features in order to establish some basis for the correct diagnosis of this condition, for it sometimes happens that cases are reported as gastric vertigo which do not give the clinical features of this form. I refer especially to conditions of intense cardiac, pulmonary, and cerebral disturbances, accompanied by vertigo, which occasionally follow attacks of acute indigestion. In such cases, the vertigo is but a part of a severe train of nervous and vasomotor phenomena which may follow indiscretions in diet, but it is not possible to regard the vertigo as the principal feature of these attacks.

The description of the cerebral phenomena given by Trousseau is clear, but the uncertain knowledge and classification of gastric diseases existent at the time did not permit of much specification in this direction, and hence, it has generally been accepted that stomach vertigo is an occasional accompaniment of chronic gastric catarrh, whatever this term might signify. As, however, the classification of chronic gastric diseases has been developed in succeeding years, the possible application of the term chronic gastric catarrh has become more limited and, as a result, attempts have been made from time to time to associate gastric vertigo with the various well-defined pathological conditions revealed by a more scientific study of diseases of the stomach.

A simple classification of chronic gastric diseases for the present purpose would be the following: (1) Disorders of secretion due to inflammatory or non-inflammatory conditions; (2) disorders of motility resulting in atony or dilatation; (3) displacements; (4) simple neuroses. Such a classification would tend to prevent confusion and it remains to be determined whether gastric vertigo can be associated with any one particular class mentioned.

Numerous attempts have been made in this direction. Ewald, Leo, Rosenheim and Fleischer regard vertigo as a possible complication of chronic inflammatory disease of the stomach. Boas, Pick and Herz attribute it to atonic conditions. Fleiner and Hemmeter look upon it as one of the many results of neurotic affections and Hayem and Robin suggest that it may occur in connection with any chronic gastric disease. A further difference of opinion exists as to the relation, if any, which may be present between the vertigo and the acid secretion of the stomach.

In this regard, Ewald and Leo would have it occur most frequently in connection with hypochlorhydria, while Fleiner, Riegel and Hemmeter suggest that hyperchlorhydria is usually found. There are others, among them, Fleischer, Rosenheim, Boas and Hayem who hold that any degree of gastric acidity may be possible during this complication. Various views have also been projected in regard to the frequency of this form of vertigo. Boas, Rosenheim, Hemmeter and Riegel look upon it as a frequent complication, whereas Fleischer and Hayem have rarely observed it. Singer, in an analytical discussion of the cases presented by Trousseau, denies the possibility of vertigo as a direct result of gastric disease and Hayem suggests that in most cases an eye or an ear lesion will be found to exist. Leube declares that vertigo occurs in 17 per cent. of cases of nervous dyspepsia and rarely complicates cases of dilatation.

The mechanism of production of gastric vertigo has been a subject for much speculation and, as Hemmeter suggests, rests entirely upon hypothesis. The older observers regarded it as a reflex phenomenon, but the manner in which such a reflex could be produced was a subject for theory based upon reasoning by analogy from observation of the effect of gastric irritation upon the heart's action and the pulmonary circulation. When Trousseau asserted that this form of vertigo was the result of reflex action through the sympathetic and vagus nerves upon the vasomotor centers, his assumption appears to have

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been verified by the observations and experiments of Mayer and Pribram upon the effect of gastric reflexes upon the pulmonary circulation. These experiments seem to indicate that irritation of the coats of the stomach may cause constriction of the arterioles in various parts of the body, thus producing increased resistance to and interference with the action of the left ventricle. Barie and Potain suggest, in this connection, that the reflex influence leads to a dilatation of the arterioles and labored right heart action. The same difference of opinion exists as to the condition of the cerebral circulation in cases of gastric vertigo. Trousseau maintained that cerebral congestion was present during such attacks, whereas Leube regards them as a result of cerebral anemia. Reasoning by analogy from Fleiner's observations upon allied conditions, such as hemicrania-gastrica, which according to him may be either sympathico-tonic or angio-paralytic, gastric vertigo might possibly be due to either cerebral congestion or anemia, assuming always that it is a result of vasomotor disturbances.

A further difference of opinion exists as to the routes pursued by these reflexes. Two possibilities appear in this connection. One of them carries the impulse directly from the stomach through the vagus and sympathic nerves to the cerebral centers. Those who accept this explanation, reason by analogy from the experimental studies mentioned above and from such cases as those of Leube in which a simple digital rectal examination or the passage of an ordinary lavage tube caused intense vertigo. I have encountered one such case, myself. It was that of an intensely neurotic woman in whom suggested rectal alimentation had to be abandoned on account of the servere cardiac and vasomotor and cerebral disturbances which would follow immediately upon the introduction of a nutrient enema.

The other theory carries the gastric reflex impulse to the centers of equilibration indirectly through the labyrinth. According to Woakes, the internal ear receives its blood supply from the vertebral artery and its branches, which latter also supply the inferior cervical ganglion. This receives a branch of the pneumogastric nerve and thus offers an explanation of the intimate relation existing between the labyrinth, the heart, and the upper part of the intestinal tract. The direct cause of the vertigo, if this conception is correct, would consequently be some irregularity in the blood supply of the labyrinth. In 1885 Menière accepted the theory of Woakes and attempted to prove by clinical statistics that chronic gastric diseases could cause ringing in the ears and even deafness. Of 44 cases examined, 43 are said to have complained of ringing in one ear, and audition was impaired in 50 per cent. All other theories are based upon these original statements of Woakes and Menière. Fleiner suggests in this connection, that the impulses might be transmitted from the stomach through the pneumogastric nerves to their centers in the medulla. These lie adjacent to those of the acoustic nerves If in neurotic individuals the centers for both these nerves have been irritated for a length of time, an impulse received in one might be transmitted to the other and thus lead to disturbance in labyrinthine pressure resulting in tinnitus aurium and vertigo.

Since the sweeping claims of Bouchard for auto-intoxication as the cause of all nervous phenomena attendant upon chronic gastro-intestinal diseases were first advanced, numerous attempts have been made to directly connect gastric vertigo with this condition. As little actual knowledge exists as to the nature of the toxines producing auto-intoxication, it is difficult to understand why in one case they should produce tetanie, and in another vertigo, except perhaps upon the uncertain basis of individual predisposition. Some assistance to a solution of these problems might be obtained from any definite knowledge which we might possess of the local gastric conditions under which the poisons are produced. Here, however, opinions differ again. Bouveret and Devic isolated their toxines from cases of hyperchlorhydria, whereas Cassalt and Férè extracted the same substances from normal stomachs. On the other hand, Brieger, Fleiner, Bamberger and Albu assert that these toxines can only be obtained from those cases in which fermentation and putrefaction are rendered possible by impaired muscular activity of the stomach. Boas contends that gastric vertigo can only occur in myasthenia gastrica and Pick in an analytical study of some 50 cases, reports an atonic condition in each one. Whatever may be the respective merit of these views, their practical development is more likely to lead to important results, for they have for their object the determination of the pathological conditions in the stomach necessary for the production of such phenomena as do occur in the central nervous system in connection with gastro-intestinal diseases.

That any actual relation exists between abnormal gastric acid secretion and vertigo has never been demonstrated and it appears to have been a matter of chance that some observers have reported hyperchlorhydria and others hypochlorhydria. This is natural when we consider that we may have any degree of acid secretion in connection with most chronic gastric diseases. Chronic gastritis, atony or dilatation, the various neuroses, and the displacements may show increased or diminished acidity, the extent of which will depend upon the duration of the disease and the pathological changes in the mucous membrane. If vertigo is associated with cronic gastritis in its early stages when proliferative changes are taking place in the mucous membrane hyperchlorhydria may be found. If, however, the disease has progressed to the atrophic state, hypochlorhydria will be present. The same rule exists for most of the other diseases, especially so for atonic conditions. The hyperchlorhydria which may occur in the early stages of atony and which is due to the prolonged irritation resulting from food stasis, will in time give way to normal

acidity and finally to subacidity in consequence of exhaustion due to overstimulation. I have seen attacks of vertigo repeated through these stages in the same case. The great fluctuation in the amount of acid secreted at different times in the same individual in the distinctly neurotic affections of the stomach renders the determination of any relation between this function and the vertigo extremely difficult and uncertain, and yet in this class of cases, vertigo occurs most frequently.

I have taken from my records a certain number of cases bearing upon these points. In these cases an exact diagnosis of the gastric conditions was assured by repeated chemical and physical examinations and both the slight and severe forms of vertigo have been included.

Of 50 cases of nervous atonic dyspepsia associated with vertigo, 66 per cent. were subacid and hyperchlorhydria existed in 10 per cent. Of 50 cases of purely nervous dyspepsia associated with vertigo, 42 per cent. were subacid and hyperchlorhydria was found in 17 per cent. Of 50 cases of chronic gastritis associated with vertigo 78 per cent. were subacid and hyperchlorhydria was present in 7 per cent. In 25 cases of dilatation vertigo was present in 7. Of these 4 were subacid. In 25 cases of gastroptosis vertigo was present in 5. Of these 3 were subacid. I have further found that in cases of achylia gastrica and hyperchlorhydria, taken irrespective of the underlying basis, vertigo occurs twice as frequently in the anacid variety as in the hyperacid.

From these figures it might be concluded that some relation did exist between subacid conditions and vertigo. That this is only apparent will appear from the following percentages of acidity taken from the same number and variety of diseases, not associated with vertigo. Among such of nervous atonic character, 33 per cent. were subacid and hyperchlorhydria was found in 11 per cent. Of the purely neurotic cases 39 per cent. were subacid and hyperchlorhydria existed in 20 per cent. Of the chronic gastritis cases 72 per cent. were subacid and 10 per cent. the reverse. Among the dilatation cases subacidity was found in 31 per cent. and hyperchlorhydria in 17 per cent. and of the cases of gastroptosis 60 per cent. were subacid and hyperchlorhydria was present in 10 per cent.

Such figures would seem to indicate that very little difference exists between the percentages of acidity found in the vertiginous and non-vertiginous cases. The excess of subacidity shows itself in both classes and the percentage of hyperchlorhydria is approximately equal in both. Whatever of value these statistics may have they at least demonstrate that very little relation exists between gastric acidity and the vertigo, for it is reasonable to suppose that if this were the case, that abnormal secretion which causes the greatest irritation, would preponderate. On the contrary, we see that the reverse is true. On the other hand, if subacidity were a causative factor in the production of vertigo, we would expect to find the greatest number of such complications among those cases in which subacidity is most prevalent, namely, cases of chronic gastritis. Vertigo is found, however, in only a small percentage of these cases. The greatest variation in gastric acidity exists among the neuroses and vertigo is mostly associated with these cases. It is well known that the abnormal acid secretion in such cases is the result of central nervous influence. This being so, any direct relation between gastric acidity and the vertigo becomes still more improbable, for the same impulse which increases or depresses the secretion is very likely to affect the vertigo through the cerebral centers responsible for this phenomenon. In truth, attacks of vertigo are just as likely to occur during periods of secretory depression as they are during periods of stimulation.

While there appears to be no connection between the vertigo and the various degrees of gastric acidity, it is still possible that an abnormal acid secretion might be the remote cause of the vertigo by inducing certain irritability of the mucous membrane and thus rendering it more impressionable. In this connection, however, it must be remembered that gastric irritability and gastric acidity are not always interchangeable conditions for achylia gastrica may exist for a long time without dyspeptic symptoms. It is further known that the diagnosis of hyperchlorhydria in certain cases is purely a relative one since through Talma we have learned that what is usually considered a normal quantity of free hydrochloric acid may, under certain local conditions of hyperesthesia, be regarded as a true hyperchlorhydria for that particular individual.

The simplest clinical indications of gastric irritability are pain and nausea, and if the latter is accompanied by vomiting, it may be regarded to a certain extent as an index of the reflex possibilities from the stomach. It would be interesting to know in what proportion of cases these two subjective symptoms were pronounced. An examination of the cases with this end in view reveals that in the purely neurotic cases with no atony and with vertigo, no pain whatever was present in 57 per cent., only slight painful sensations existed in 21 per cent., and considerable pain was endured in 22 per cent. In the same class of cases without vertigo the figures were practically the same, namely, 46 per cent. without pain, 28 per cent. with slight pain, and 26 per cent. with excessive pain. Nausea existed in these same cases in somewhat similar proportions. In those with vertigo it was absent in 50 per cent., occasionally present in 35 per cent. and pronounced in 15 per cent. In those without vertigo it was absent in 59 per cent., slight in 27 per cent., and pronounced in 14 per cent. These observations would seem to indicate that very little causative relation exists between gastric irritability and vertigo in the minor inflammatory affections of the stomach. In the inflammatory cases the proportions were practically the same. In the series representing chronic gastritis, with vertigo, pain and nausea were absent in 75 per

cent., while in those without vertigo the same symptoms were absent in 80 per cent., differences which are hardly worth considering.

In estimating the value of these statistics, it should be remembered that clinical statistics bearing upon chronic gastric diseases should always be taken with great reserve for here as no where else does so much depend upon the habits and surroundings of the individuals, so that what might be true for one class of patients under their conditions of life, might not be so for another class with entirely different conditions. Still, allowing for this contingency and taking a broad view of the results, it does appear that no determinable relation exists between gastric acidity, gastric irritability, and vertigo, a conclusion which corresponds with the observation of Trousseau who states that in many of his cases stomach symptoms were entirely absent. This view is further supported by the fact that vertigo is morely likely to be associated with the early stages of chronic gastric diseases than it is with the advanced changes in secretion and motility entailing pronounced suffering.

The frequent association of vertigo and atonic conditions in the stomach has led to the belief expressed in some quarters that this form of vertigo is always due to impaired motility or the fermentation resulting therefrom. There are certain facts to be considered in this connection. That vertigo should be associated most frequently with atony is comprehensible, for atony is probably the most common pathological condition known among chronic gastric diseases. It should further be remembered that most cases of atony have sprung from general neuroses with this result, that the nervous atonic dyspepsia is the most universally distributed. It will often be found, however, upon close examination that the vertiginous attacks antedate the gastric symptoms in these cases. Atony is not a common accompaniment of chronic gastritis, but vertigo does occur in a certain proportion of such cases. The same can be said of gastroptosis, whereas in cases of dilatation due to atony, the gradual transition from one condition to the other, does not result in increase in the frequency of the vertigo.

The impression which is effected upon the central nervous system for the production of gastric vertigo in cases of atony, may be accomplished in two ways. It may be the result of reflex action due to increased intragastric pressure from excessive gas production, or it may be due to auto-intoxication from toxine production. So far as the production of gas is concerned, it was found upon analysis of the cases given above that of the nervous atonic cases only 30 per cent. were afflicted with excessive epigastric pressure, whereas the cases of chronic gastritis gave this symptom in 70 per cent. In order to explain this discrepancy it would be necessary to assume that a combination of moderate gas production and excessive gastric irritability might exist, and thus produce the necessary reflex. When we consider, however, that these cases are usually subacid and that the suffering attendant upon them amounts to discomfort rather than great actual distress, the direct association of the vertigo and gas production becomes still more difficult. It should be remembered in this connection that most chronic dyspeptics are liable to ascribe all their symptoms to the excessive production of gas. In many cases, however, it will be found upon close examination that no reason for such exists and that all the pressure symptoms will disappear upon the administration of some local sedative.

As a certain irritability of the nervous system is necessary for the production of vertigo and as such irritability usually results in the course of chronic gastric diseases, it has been assumed by some authorities that the primary causative factor, under these circumstances, is auto-intoxication, thus offering a second possible explanation for vertigo in atonic conditions of the stomach. It is very probable, however, that other influences, such as malnutrition, are at work here also, for the fermentation resulting from food stasis may not only produce toxines, but in so doing convert a certain portion of the ingested food into products which are devoid of nutritive value. In this way, the general nervous irritability is explained and auto-intoxication stands as the remote cause for any of the nervous phenomena which may occur under these circumstances. Why in the one case the phenomenon should be vertigo, in other tetanie, and so on, can only be explained upon the uncertain basis of individual predisposition, which latter is again determined by the habits, occupation and surroundings of the subject. Hence, given gastric conditions which make auto-intoxication possible, we have in this a plausible but indirect explanation for the slight and momentary attacks of vertigo so common in the course of chronic gastric diseases. Auto-intoxication, however, cannot account for the vertigo in cases where no conditions exist for toxine formation, nor can it account for the sudden and violent form described by Trousseau. In the latter cases, it would be necessary to assume the sudden production and absorption of a large quantity of toxin, which is hardly conceivable without decided gastric symptoms. Where such rapid production does take place the reaction on the part of the nervous system is general and vertigo may or may not be an accompaniment of the complex disturbance. Added to this we have observations that the condition described by Trousseau is uncommon in cases of intense dilatation due to pyloric obstruction and yet these are the most fertile conditions for auto-intoxication.

This difficulty in connecting actual gastric conditions with vertigo is probably the chief reason for the various opinions in regard to the frequency, cause and diagnosis of this phenomenon. The simple association of vertigo with nausea and vomiting is not sufficient for the diagnosis of stomach vertigo, for all forms of vertigo, from whatever source, if persistent enough, will be accompanied by nausea, nor does the fact that

artificially induced vomiting will cut short an attack, render the diagnosis assured. Vomiting is sometimes induced for the purpose of relieving muscular spasm under other circumstances, so that it is reasonable to assume that it would act likewise in conditions of vasomotor spasm. It appears that cases sometimes are reported as gastric vertigo, simply because there happens to be some such association, when in reality, upon close inspection, it will be found that the gastric symptoms represent a result and not a cause. In other and more severe forms of nervous reactions, due to intragastric conditions, the vertigo is but a part of a disturbed whole to which the terms "dyspeptic asthma" or "angina" could be applied with equal felicity.

Such arguments appear to indicate that the determination of the frequency of gastric vertigo must depend largely upon a correct judgment of the factors which constitute this condition. Are we to take as examples only such cases, the type of which has been described by Trousseau, or can we include all cases in which vertigo and certain pathological gastric conditions happen to be associated. In the one case gastric vertigo would be rare, in the other, exceedingly frequent. In order to partially obviate this uncertainty, it would seem desirable to have some classification of the various conditions of association of vertigo and chronic gastric diseases. Such a classification must be imperfect at best for the various types will often run into each other, but even in an imperfect form, it may assist in differential diagnosis.

A classification, which would include the various types, is the following: (1) Cases in which the vertigo is intense and the only prominent nervous symptom. There may or may not be gastric symptoms and there may be no history of dietetic indiscretion. This is the type described by Trousseau; (2) cases in which the vertigo is associated with intense palpitation, precordial fear, dyspnea, and possible syncope following isolated acts of indiscretion in diet; (3) cases in which the vertigo occurs as a momentary sensation in the course of well-defined pathological conditions in the stomach. These types are given in the order of their frequency and the mechanism of production varies according to the one involved.

The first class assumes the existence of a chronic gastric disease with or without dyspeptic symptoms. There need be no act of indiscretion in diet and the discrepancy between the severity of the vertigo and the gastric symptoms is often pronounced. This may be so to such an extent that some authorities have doubted the existence of this type. Trousseau admits that in some of his cases the attacks were produced by regarding a revolving object and that a general tonic treatment was sufficient to reduce their frequency. These attacks occur with great suddenness and at times in individuals in apparent health. In rare instances, they may occur during sleep at night. A prominent feature is the great fear which attends them, an intense impression of impending evil. Beyond slight palpitation there need be no other symptom, and the attacks are usually of short duration. Sometimes they end in a spell of vomiting. They are usually infrequent, but may recur with a certain periodic regularity, one attack predisposing to another. The mechanism of production in these cases can only be a reflex for it scarcely seems possible to assume auto-intoxication as the cause, unless we acknowledge the sudden formation and absorption of a certain quantity and quality of poison calculated to produce the one symptom. The results obtained thus far by research do not justify such a view, and this type of gastric vertigo often occurs in individuals whose gastric conditions do not admit of auto-intoxication. On the contrary, it rarely occurs by itself in advanced stages of atony or dilatation. There are no specific gastric states with which this type can be directly connected and fortunately the cases are rare.

The second class of cases occurs more frequently than the first and can usually be traced to some dietetic indiscretion. It seems hardly justifiable to call these cases *gastric vertigo*, for the latter is not the principal feature of the attacks. These patients have indulged in either a too hearty or an unusual diet and are suddenly seized with severe epigastric pain and pressure which is followed by intense palpitation, dyspnea, vertigo and possible syncope. There is some danger of a fatal termination in these cases, whereas simple gastric vertigo can have no such ending. The mechanism of production here is more complex than in the first class. It consists of a mechanical, or reflex interference with the heart's action due to intragastric pressure as a result of the rapid production of gas. This in turn leads to interrupted pulmonary circulation causing the dyspnea or irregular cerebral circulation causing the vertigo. The latter may also be caused by the intense fear which usually accompanies such attacks. That auto-intoxication should be responsible for some of these cases may be a possibility provided a sufficient length of time has elapsed between the onset of the attack and the dietetic indiscretion. Many of these cases, however, occur very shortly after meals at a time when fermentative or putrefactive changes in the food could not be very far advanced. Here auto-intoxication is out of the question, for it is usually a slow process, whereas the onset and course of these attacks are sudden, rapid and alarming. They are cases for the nearest doctor, and their frequency lies midway between the first and third types.

The third class comprises those cases in which the vertigo is associated with chronic gastric diseases as a momentary sensation. Such cases are numerous, but the evidence of any causative relation existing between the vertigo and the gastric disease is often very obscure. A general neurosis usually is present at the same time and the diagnosis of gastric vertigo will depend largely upon

the time relation which exists between the neurosis and the gastric disease. Should the etiology show that the neurosis existed before the stomach symptoms set in, the vertigo will probably be of the neurasthenic variety. If, on the other hand, the neurosis developed as a result of the gastric condition, the vertigo may be due to the latter in so far as the stomach can be looked upon as the remote causative factor. This, however, does not imply that this organ can be accredited with the immediate attacks, for we have seen how difficult it is to connect such an attack with the individual gastric symptoms. I am inclined to believe that in the majority of these cases the vertigo is due either to external influences affecting the special senses or originates in the central nervous system as a result of a prediposition engendered by the mental depression or irritability and general loss of confidence developed by long suffering. Agarophobia is commonly associated with the vertigo in these cases and often precedes the attacks. This loss of the sense of security is conducive to a loss of equilibrium so that such patients soon find themselves in a condition of "vertigo fear" (Schwindelangst—Brücke). Sudden fear or shock is very apt to produce disagreeable and even painful epigastric sensations which, in cases of nervous gastric diseases, may lead to nausea and vomiting. In this way, the stomach is often immediately associated with attacks of vertigo, when in reality, the rôle played by this organ is purely secondary.

It has seemed advisable to direct attention to these few facts on account of the tendency to shift upon the stomach the responsibility for a lot of nervous phenomena which happen to appear in the course of chronic gastric diseases. In this connection, Van Noorden regarded melancholia in the light of a gastric secretory neurosis, because hypochlorhydria happened to be present in twelve cases. Clozier claimed that the majority of hystero-neuroses were due to congestion of the whole abdominal system. Faber, while admitting that zones of hyperesthesia might exist in chronic gastric disease, suggests that a general neurosis must be present also. Other examples are the so-called stomach cough (Ball), loss of sight after hematemesis (Graefe), tinnitus aurium (Menière, Levan), neuralgia of all kinds (Debu) and, finally, a case of labioglossolaryngeal paralysis due to vagus neuritis, starting in the stomach and leading to bulbar myelitis (Cuffer). Suggested and then denied, these few theories are only specimens of the numbers which have appeared from time to time, and can serve to demonstrate the necessity for a detailed analytical study of the etiology and symptomatology of each gastric disease, for mere association or the effect of treatment upon such a disease cannot guarantee the existence of a causative relation between the two. Many remote effects of malnutrition may be affected by treatment of digestive irregularities and patients are naturally very apt to attribute all their ills to a deranged stomach, for no organ affects the disposition or directs attention to itself to such an extent as does this one.

When we consider, moreover, the number of pathological conditions of other organs which are said to produce vertigo by reflex action, it seems advisable to limit this possibility from any particular one, for "by reflex action" must be an uncertain explanation at best. In this connection, I will only mention laryngeal vertigo (Charcot), cardiovascular vertigo (Grasset), aural vertigo (Menière), retinal vertigo (Mendel), nephritic vertigo (Bonnier), epileptic vertigo (Hitzig), rectal vertigo (Leube), neurasthenic vertigo (de la Tourrette), and infectious vertigo (Gerlier).

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NOTES ON THE SELECTION OF A CLIMATE FOR THE TREATMENT OF TUBERCULOSIS.*

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NO FACTOR at our command to-day is more potent in effecting a cure, and, in the majority of cases, in ameliorating the symptoms of tuberculosis, than the influence of a proper climate. With new research laboratories planned on a gigantic scale, with their corps of workers seeking to stamp out disease, and especially "The Great White Plague," I believe that some method easy of application will be soon secured to cure and exterminate tuberculosis. Until these novel research workers tell us of their discovery, however, the general practitioner and the health boards of our municipalities must put their trust first and foremost in a land where sunshine is longest, relative humidity lowest, and yet with sufficient altitude and certain necessary atmospheric conditions to produce the essential results. The Health Board of this city, with the cooperation of such men as Lederle, Biggs,

* Read before the Alumni Association of Bellevue Hospital, March, 1903.

Loomis and Wilson is to-day doing its utmost to stamp out consumption and, at the same time, to effect cures with the limited means at its command; the establishment of its new tent colony is greatly to be commended. But, even the Board of Health with its able coadjutors is too heavily handicapped in its work by the enormous mass of foreign immigrants poured in on us weekly. Many of them come from rural districts, and take up life here, compelled to face the changed climatic conditions of a city, a climate ready to develop in them tuberculous infection. Those of us who have worked among them on the East Side, know full well of their poorly nourished bodies, with systems only too ripe for the infection to be found in the overcrowded and unsanitary quarters they must necessarily occupy.

In my opinion, infection would be greatly lessened in the city if, on sunshiny days, all employes were compelled to take their midday meal away from the building in which they are employed; or else that their places of business should provide roof gardens, or sun-rooms, for this purpose. The use of prisms, humidifiers, modern automatic ventilating apparatus and possibly the new glass paint just discovered by Galpin, especially in the construction of lofts and buildings set aside for large colonies of workers, should be more urgently insisted upon. Another suggestion occurs to me that in all factories, sweat-shops and places where the number of cubic feet of air is far below normal for the workers employed, at least once in twenty-four hours the floors should be sprayed with a solution of formalin of not less than 1 to 5,000 strength; or formaldehyde vapor should be liberated in the same space. The use of recreation piers enclosed in glass in winter seems advisable.

When we look into the climatic condition of New York and compare it with other localities, we can readily realize that something must be done if we are ever to check the development of this dread disease.

New York State, covering an area of 49,170 square miles, in 1900 had an estimated population of 7,268,894, or 152.6 people to the square mile. Of this, New York City alone, with an area of 308 square miles, had a population of 3,437,202 people for the same year, or an average of 256 the square mile. On the other hand, Arizona, occupying as it does 113,020 square miles, shows a population of 122,931 in 1900 (24,333 of which are foreign born), or an average of 1.1 persons to the square mile; Colorado, an area of 103,925 square miles, with a population of 539,700 (91,155 of which are foreign born) shows an average of 5.2 persons to the square mile, or Denver, covering 54 square miles, having a population of 150,000; New Mexico, with an area of 122,580 square miles and a population of 195,310 (13,625 of which are foreign born, shows an average of only 1.6 people to the square mile).

The statistics for probably the worst month in the year for the growth of bacillus, *i.e.*, March, are as follows: In 1901, March showed only 49 per cent. of sunshine, or 182.7 total hours.

Under the existing conditions of life to-day I believe it is impossible to cure tuberculosis in the City of New York, and I look upon it as an error of judgment for any medical man to keep a case, especially in its early stages, in this city. For nearly one year I lived in that region of the United States in the Rocky Mountain chain, extending from the middle of British Columbia, on the north, to the City of Mexico. During that time I had the opportunity of studying carefully the character of this region in all its particulars, with a view to finding the most suitable place for the treatment of the different stages of tuberculosis. During my investigation I became convinced of the advantages, especially offered by places in Colorado, New Mexico, Arizona and Western Texas. I have also spent some time and pursued my investigations in the Adirondacks and parts of North and South Carolina, and in my opinion, residence in these districts, under proper conditions of hygiene, sanatoria and tent life, helps to prolong life, ameliorate suffering, and probably effects some cures. These sections, however, compared most unfavorably with the selected territory of the Rockies previously mentioned, on account of the lessened altitude, unusual humidity, fogs, great rain and snowfall, the increased wind currents, markedly variable temperature and, consequently, the decreased number of days of sunshine and strength of sunrays, in some instances also, the proximity of large centers of civilization.

With the vast wealth that New York City commands, it seems not only possible, but imperative, that large sanatoria should be built in places best suited for the cure of this disease. It matters not whether the colonies to be established be municipal, state, philanthropic or national—this is a question that cannot be too strongly presented to the community, for it touches every man, woman and child who resides within the bounds of our city.

A consideration of the geography and meteorology of the Adirondacks seems useless, as every medical man interested in this subject is absolutely familiar with this region. Undoubtedly the proximity to the St. Lawrence Valley tends to greatly increase the moisture and rainfall of this district. Then, the altitude is not to be compared with that of places west of the Mississippi. The work of Trudeau and the elder Loomis is quite familiar to all of us and, in passing the Adirondacks, probably the best places are the Adirondack Cottage Sanatorium, accommodating about 100 people, and the Saranac and Lake Placid regions, with a relative humidity generally of about 73 per cent.; 132 clear days are observed, 104 partly cloudy and 129 cloudy. Rain falls from 30 to 40 inches. One might also mention the village of Ray Brook, situated in the heart of the pines, a short distance from Saranac Lake. The air here seems antagonistic to the growth of the bacillus as it is never found in the

cattle of the region. The altitude is about 2,300 feet, the altitude of Saranac Lake being about 1,800 feet.

"Of 173 patients 45, or 26 per cent., were discharged as cured; in 79, or 45 per cent., the disease was arrested; 39, or 22 per cent., were discharged in an improved condition; 4 were doubtful and 1 died.

In 40 incipient cases, after a residence in the sanatorium of from 3 to 17 months, 33 were discharged cured, in 6 the disease was arrested, and 1 improved.

In eighty-four advanced cases twelve were cured, in fifty-five the disease was arrested, fourteen improved and three did not improve.

In seventeen far advanced cases the disease was arrested in six cases, ten improved and one did not improve.

Of 141 cases 133 gained on an average of fourteen pounds in weight, five lost weight and three remained stationary."

A charitable philanthropy, much to be commended, now nearing completion, is the Stoney Wold Sanitorium, a station or two above Paul Smith's. It will undoubtedly fill a long-felt want in caring for the more deserving classes of the poor. Unfortunately, it is situated in the wake of civilization, and one will be almost able to shake hands with the patients from the railway carriage, and certainly patients cannot escape breathing the smoke-laden air from the passing trains. The consumptive must avoid civilization, so to speak. His home for at least a certain portion of the year, if we could achieve the ideal, would be in the fast-fading wilderness.

The district near the town of Liberty, New York, should be mentioned. The soil is loam and clay, and the average altitude is about 2,300 feet. The snow generally remains most of the winter. The statistics of the Loomis Sanitorium undoubtedly point to this as being a fair place for the tuberculous.

Advanced cases seem to do very well in Aiken, S. C., a very low altitude, but, for unexplained reasons, quite the driest place east of Denver. The mountains of Western Pennsylvania offer some advantages, while the pine belts of North and South Carolina, probably influence some cases.

Northwestern North Carolina, with an altitude of 5,000 feet, especially near Cæsar's Head, Blowing Rock and Hendersonville is also good, provided one can get good accommodations. The best way to pass the time in either of these places is in tents or log cabins. Asheville, N. C., has been thought well of by some medical men for years, but it seems to me to be overcrowded, and has an altitude of only 2,339 feet, a relative humidity of 65 per cent., and plenty of red porous clay.

Occasionally a tuberculous case will do well at the seaside resorts, and the Island of Nantucket offers a balmy climate in summer, while Southport, near Wilmington, N. C., with 54 per cent. of sunshine, makes an all around delightful annual resort, if one can believe the seashore is to be advocated.

Dr. Cohen mentions Boerne, Texas, as an admirable place, and recently I have heard good things said of San Angelo, in Southwestern Texas. Many English people have gone there. The life is good, and the encouragement of outdoor sports adds great charms to the place. In passing, one should mention El Paso, Texas, with 3,754 feet of altitude, 49 per cent. mean relative humidity, moderate winds, protected northwest and south by the Rocky Mountain spurs. It is becoming quite a popular resort from September to May for those who are going West, but wish to try a moderate altitude for a few months. Laryngeal cases are said to do especially well in this locality. The heat of Texas makes it a land to be avoided, however, in the summer months.

For almost every case of tuberculosis, however, especially when it is now possible to make a railroad journey of three days so comfortably, the ideal vantage ground of the world to me today is the State of Colorado and the Territories of New Mexico and Arizona. So important do I look upon this district that I deem it advisable to describe in detail the country, the life to be found there and the permanent advantages afforded the sufferer—the anemic, the chlorotic, the predisposed, as well as the sufferer from tuberculosis.

Undoubtedly, either through travel or reading, we are all of us more or less familiar with the great West, but I would like to call your attention briefly to that portion of it which I consider ideal for the tuberculosis patient, namely Colorado, New Mexico and Arizona. We will take Colorado first. This State is situated in the central belt of States in the Rockies, and you will find that in Colorado the highest development of the Rocky Mountains is reached. It abounds in numerous lofty peaks, many of them over 14,000 feet elevation, notably Pike's Peak and Long's Peak. The eastern part of the State is a vast plain, sloping away to the Kansas line, with an average elevation of 4,500 feet. The western and central portions of its area are occupied by an intricate plexus of wild and irregular ranges, enclosing valleys known as "Parks," most of which are extremely fertile and well wooded, and it was in these parks I spent a most enjoyable sojourn, and about which I am especially enthusiastic. The delightful life one can lead here recalls memories that only the realization of one's ideals can equal. The northwestern corner of Colorado is the land for the boy and girl between the ages sixteen and nineteen years. A summer, the nights of which are spent in a sleeping-bag in a tent, or lean-to, would destroy all chance of infection, which children of the more highly bred, may have in their bodies. These parks are hemmed by thick forests of spruce and fir, and the very air seemed so heavily impregnated with the delicious antiseptic vapors as to make it, in itself, almost possible to sustain life. Ozone is

said to be greatly increased in these piney woods by certain chemical changes, which take place in the leaves, about which very little is known as yet, and which yield a salubrious effect. The sun's rays are hot, invigorating and delightful in the summer. Many early cases are sent up into these picturesque park lands in the northwestern corner, where I camped among the multicolored flowers and rushing streams, the balsams, firs and cedars. The projected railroad between Denver and Salt Lake City will make this land, now only available by pack trains, the vantage ground for the summer, and for a great sanatorium, National, I trust. The altitude is from 7,000 to 11,000 feet. The coldness and crispness of the air of these higher altitudes gives out a drying, tonic effect, stimulating and strengthening the invalid, and exercise a most inhospitable attitude toward this bacillus and the germs of pus. I have seen miriads of mosquitoes in a belt a mile wide, feeding so furiously as to stampede the pack-horses, but as the sun faded over the hill all insect life was stilled, and we slept with the greatest comfort. With all this the voice of nature is supreme, which means local immunity, the density of the population being hundreds of times less than in a city, and the life absolutely free from chances of infection. The effect of the change from the cities is good and the "advent of a tuberculous fire, which had rekindled in Denver, has been effectually stamped out by a sojourn in these parks."

Speaking generally of Colorado, however, the precipitation of winter is almost wholly in the form of snow. In the plains and valleys it is light, but, of course, this fall is very much heavier on the mountain slopes, and is apt to last into April and May. The rainfall in the mountain regions increases in July and August, but take it altogether, the climate is dry and healthy. There are no fogs, a low atmospheric pressure, an average wind movement of about seven miles an hour, and a marked difference in the sun and shade temperature; for instance, at two o'clock in the morning one requires the heaviest blankets and coats to keep warm, while at twelve o'clock noon it is almost impossible to ride in the sun. Aside from being a favorable climate for tuberculosis, Gardner concludes that the climate of Colorado exerts a most beneficial effect in all diseases of the gastro-intestinal tract characterized by diarrhea, *i.e.*, enterocolitis, cholera infantum, dysentery, etc., and the death-rate among infants and children from these causes is excessively small in Colorado as compared with other States. Then, too, the milk supply, due to non-septic air, moderate thermometric range, and, in most cases, the splendid physical condition of the cattle makes possible a far better nutriment in bottle-fed babies; while the mother who nurses her child has the added advantage of healthy, life-giving environment, and must necessarily impart to her baby the vigor derived from air and sunshine. You can readily understand, therefore, that the climate of Colorado tends to encourage and make possible a more perfect and higher physical development in the child.

To return to our subject-matter, you can readily see from this brief description, that Colorado is eminently suited to the requirements of our tuberculosis patients. Let us take Denver, for instance, which I always think of as "The Parlor City of the Plains," and which is justly famous as "The City of Beautiful Homes." Many consumptives are attracted to this city, owing to its beauty and healthfulness. Certainly the number of active, wealthy and useful business and professional men who have recovered their health and strength in its environments, and have finally made Denver their home, constitute one of the strongest endorsements for the healing properties of Colorado's climate. It shows a record of 42 per cent. of clear days, as against New York's 27 per cent.—New York double the amount of cloudiness. Then, there are no lack of splendid accommodations, either in hotels or boarding houses, the best board in private houses ranging from $8 to $10 per week.

I cannot too strongly impress upon you the cruelty, if not danger, of sending a patient to any resort if he has not the means of procuring all necessary comforts, at least until he has so far recovered as to permit of his engaging in some pursuit, which will aid him financially. The consumptive, as a rule, is imbued with the idea that the change to a good climate is going to cure him very shortly, but we who know, realize the months, and sometimes years, which will ensue before a cure is effected. The more advanced the disease the greater responsibility rests upon the doctor in recommending a change, unless the patient's finances can stand the drain, which is sure to come. The Oakes' Home for Consumptives in Denver is well thought of.

Colorado Springs, a city of 25,000 inhabitants, with an altitude of 6,022 feet, offers, in my opinion, the greatest all around advantages of any place in this country. Its days of perpetual sunshine, its charming life, its great dryness, and I do not now recall one cloudy day in the spring and summer of 1894; its environs, delightfully hospitable people—everything done for the invalid by those who are now cured, makes it stand foremost to my mind as an ideal place. It should be avoided, however, by those over fifty years old, and the advanced cases, unless they have been accustomed to living in high altitudes, say of 3,000 feet, for at least several months. Probably one of the best hotels in this country now stands upon the ashes of the old antlers. Broad avenues, mesas, country clubs, polo, coursing with hounds, beautifully furnished houses, with an ideal climate, associated with many of Nature's grandest works—canyons, formations, and curios (for instance, "The Garden of the Gods")—the only flaw being an occasional wind-storm. Females should be well veiled, and while driving should avoid the eye of the gale. Colorado Springs has no mud. Snow in the morning is evaporated or soaked into the ground within

three hours. I understand that General Palmer has granted a number of acres near his very attractive home "Glen Eyre," between the "Garden of the God" and Manitou Springs, for a sanatorium, but until this section has a great reservation with sanatoria or tent colonies in its vicinity, I would suggest it as best suited to the wealthier class of invalids. Patients should take life easily at first until they become acclimated. To-day I know of several cases of advanced tuberculosis, who, after a sojourn of from one to five years in Colorado, are now able to live in the very heart of New York. Drs. Gardner and Solly believe that Colorado Springs affords greater opportunities in the earlier stages than any other place in the foot-hill region. As I look back upon the hours I spent at Colorado Springs, with its luxuries, its varied charms and its glorious climate, I can only call it the "Newport of the Rockies—"The Paradise of the Mountains."

From Colorado Springs one goes to Manitou Springs, a delightful place sheltered by Pike's Peak, but lacking many of the advantages of Colorado Springs. Dr. John A. Robison is especially enthusiastic regarding this place, and calls our attention to the following cases: "I wish to relate one experience that I have had in sending patients to a high altitude and its effect upon the hematopoietic processes. I had under my care two young women with predisposition to tuberculosis. About two years ago one became profoundly anemic, and there was a slight tuberculous deposit in the right apex. I sent her to Mont Claire Sanitarium at Manitou. She remained there all winter and the following spring, and since returning to Chicago has been in perfect health. I never saw such a transformation, with the exception of that in her sister. When she went to Manitou she was chlorotic, her lips were almost bloodless. When she returned she had rosy cheeks, had gained in flesh, the tuberculous deposit had apparently cleared up and she has been in perfect health since. Last winter her sister became chlorotic, but there was no deposit in the lungs, and I sent her to Manitou. She returned in the course of a few months, having gained fourteen pounds. Her cheeks were rosy, her lips red, and she has retained her health ever since. These are two examples which show that the change of climate from Chicago to Colorado quickened all the blood-making processes, and it did not require a blood-count to demonstrate it."

Before leaving Colorado, I would like to say a few words regarding Boulder, where is situated the State University. This town also offers many advantages and attractions. The places at Middle Park and South Park, where the altitude is from 7,000 to 8,000 feet, are also to be considered, especially in the summer time. Glenwood Springs, twelve hours west of Colorado Springs, offers fair advantages, but is recognized more especially to-day as the best outfitting place for camping parties going to the northwestern part of the State. Estes Park, at an elevation of 7,500 feet, San Luis Park, at an elevation of from 10,000 feet, surrounding a beautiful lake, might all be mentioned as healthful spots. One must not forget the sanatoria at Falkenstein Gerbersdorf, showing an average of 51 per cent. of cases benefited, and Reibolsdorfer, with a record of 56 per cent. of cases benefited, each at an altitude of from 1,375 to 2,300 feet, with Colorado at 76 per cent.

We may now take up New Mexico. The whole surface of this territory is generally mountainous to the Arizona line, though a central valley of an average breadth of 20 miles extends across it from north to south. This valley is hemmed in by the main chain of the Rockies, many of the mountain peaks here rising to an elevation of from 10,000 to 12,000 feet. The higher ranges are covered in many places with pine forests, and lower, with cedars and occasional oaks. The climate is generally temperate, the rainfall, which comes very largely in July and August, averaging about 13 inches. Very few points receive as much as 20 inches during the year, the greatest rainfall on record being 35 inches at Old Camp Grant, N. M., in 1871. The winter rains begin about December, and practically end in March, and rarely fall as heavily as during the summer, being more or less irregular. The wind movement is less than in Colorado, but the great sand-storms sometimes occurring in the spring make it objectionable. The whole territory is practically one of sunshine and sand. So pure and dry is the atmosphere that meat hung out in the air to dry will not decompose. It is simply a splendid place for consumptives; the natives themselves seem to be entirely immune from its infection, and really do not know what the word "consumption" means in this connection. The winter climate from Albuquerque, south, is superb, but during the summer it is too warm for most patients, and its distance from most centers of interest, combined with the eternity of sand and sunshine, renders the life here sometimes a little monotonous. The only pleasure one could derive from the country would be in "roughing it," but, of course, the tuberculosis patient could not endure such fatigue at the start. By far the best part of New Mexico, considered from the standpoint of a health resort, is situated in the northern portion of the territory. The winters are mild and open, with scarcely any rain or snow, and the summers are cool and delightful. The thermometer during the winter averages about 45° F. at noon, while in summer it rarely registers above 80 degrees.

Santa Fé, the principal city, is situated in the vicinity of the loftiest peaks in the territory, and one finds it a delightfully quaint old place, still half Mexican. The summers here are enjoyably cool, dry and exhilarating, though the altitude (7,000 feet) is too great for most patients. St. Vincent's Sanitarium might be mentioned in connection with this city. Here the best of accom-

modations can be obtained at fairly moderate rates.

Albuquerque is another of the chief cities, and lies but twenty-four hours from Denver, at an altitude of 5,000 feet. To my recollection the hotels are not of the best, though there are many good boarding houses. The winters are warm and pleasant in this locality, while the summers are fairly hot, although the nights are always pretty cool. Albuquerque probably has the best climate in the southwest, although the fact that the place is overcrowded with invalids, and the lack of good accommodations is noticeable, makes the place more or less undesirable.

Silver City seems to me to afford especial advantages to those suffering from tuberculosis. It has an altitude of 5,800 feet, and the winter and spring climate is excellent. While I have never visited Silver City, I have corresponded with a patient there recently, who tells me the accommodations there are exceedingly crude, the difficulty in getting the best food very great. From what photographs I have seen of the place I should judge it to be a bustling mining town more than anything else. Throughout this region numerous small parks are to be found, and these offer a most agreeable respite during the summer months. Most of the houses are adobe huts, and it is advisable to provide a tent with sleeping-bags for the patient going into this district.

There are only two other cities in New Mexico worth mentioning, viz., Las Vegas and Las Cruces, both possessing many excellent advantages.

One notices on arriving at the resorts of the great southwest, where the altitude is over 4,000 feet (for instance, Colorado Springs, Denver, Albuquerque, Santa Fé, Silver City, etc.), how distinctly rare the air is. This, with its lessened amount of oxygen, makes us take the deep breaths, thus increasing the circulation, opening up the minutest ramifications of the lungs, and rapidly increasing chest expansion. Then, too, is observed the healing, invigorating and stimulating effect of the brilliant sunshine, sometimes as high as 120 degrees, and when the shade is sought the marked difference in temperature is felt. Occasionally the air may have a few particles of dust, but when we analyze it we note its great purity, and the total absence of fogs and mist. The sun-rays of the mountains and foothills of the Rockies contain a large proportion of the blue end of the spectrum, and these rays have marked bactericidal and germicidal powers. It is these rays that undoubtedly give the marvelously gorgeous tints to the gentians, daisies, and other wild flowers so familiar to all of us who have camped out in the summer at high altitudes. The rapid action of light, the early dawn and the prolonged twilight are two especial features of Colorado Springs, and mean for the patient outdoor life and pleasure. In summer, where most of the rain falls in almost cloudburst effects, the air seems greatly cleansed, and this cleansing, if at all necessary, seems to last for the year.

The rainfall of the foothills region east of the Rocky Mountains ranges from 10 to 18 inches, and it increases slowly toward the one-hundredth meridian. Eastward of that meridian the annual precipitation varies from a little under 20 inches to about 60 inches on the Florida and Gulf coasts. There is a gradual decline both from the Atlantic Coast westward and from the Gulf Coast northward. The diminution in fall from New Orleans northward to St. Paul is 32 inches; from Eastport westward to St. Paul, 12 inches.

I have always noticed that while snow came rarely and was rapidly evaporated, blown away or soaked into the sandy soil, it seemed to markedly intensify the light and increase its powers of reflection.

But we must not overlook Arizona, which is preeminently the land of sunshine. The physical features are: The mountain system appears at the southeastern corner of the Territory and extends in a general northwesterly direction to the borders of Utah and Nevada. More than half the territory is above the 5,000 foot contour line, and forms a part of the great plateau region west of the Rocky Mountains. About one-third of the territory is sandy plain gradually rising in elevation from less than 100 feet at Yuma, to a rather narrow bench or mesa that faces the plains about 180 miles northeast of Yuma. The elevation of the mesa ranges from 3,000 to 5,000 feet above sea-level. Beyond it to northeast is the high plateau of Arizona. Annual rainfall of this region ranges from 10 to 20 weeks. About 35 per cent. of the rain falls in July and August. May and June are generally the months of the least rainfall. The summer rains are essentially a feature of the mountain and plateau systems, and are believed to be due largely to local convection induced by excessive insolation on the barren, rocky surface of the mountain sides and summits. The winter rains are believed to be due to migratory areas of low pressure pertaining to the general system of storm movement. The character of the winter rains, whether light or heavy, depends largely on the frequency of atmospheric disturbances. Yuma, in the heart of the desert, shows 84 per cent. of sunshine. Mr. Whitelaw Reid compares the climate of this territory to portions of Egypt. He believes it to be even sunnier, drier and more delightful than the district around Luxor or Assouan. I have traveled all over the territory, and spent some delightful days shooting in the famous wide valley, 40 miles northwest of Prescott.

Prescott offered a few years ago no special advantages to the health-seeker; it was purely a mining and ranching town and was slushy and muddy in the spring.

Flagstaff, with its 7,000 feet of altitude, is charmingly situated in the wilds of mountain forests. The eastern invalid can look especially to Tucson, Phenix and Crede for comfort, climate and charm. Phenix is in the midst of an

oasis where the air is somewhat more humid, which is brought about by the increased irrigation. Tucson, with 42 per cent. humidity, is 121 miles southeast of Phenix, is 2,300 feet high, and is quite a modern southwestern town. Arizona possesses all the elements of a climate suitable for advanced cases—those along in life or where the condition of the heart muscle is a consideration. The fruits and flowers of Phenix have alone made it famous. Arizona is crossed by two great railways, and its sanddunes are becoming more and more an object of interest to transcontinental travelers. The ranchman and the eastern boys will rapidly open up the territory. I feel safe in predicting that many charming little towns will soon spring up where the altitude is below 3,000 feet—the winters will be balmy and the summers will not prove oppressively hot, as irrigation and humidity must be considered. The rainfall is often less than seven inches.

The place most highly spoken of in Arizona, and which, I trust, will soon have railway connection, is Oracle, 38 miles from Tucson, has 4,500 feet altitude. One writer calls it a "pretty mountain nook embowered with live oaks;" it undoubtedly possesses great advantages.

In parting with the wild regions of Arizona, so essential to-day in curing tuberculosis, my mind naturally reverts to the question of tents. Let me mention the Fitch & Abercrombie waterproof silk tent, 7x7 feet, and weighing but seven pounds. I have used it and find it perfect. The Munson sanitary tent is also excellent. Dr. A. M. Holmes, of Denver, deserves the thanks of the profession for his new sanitary tent cottage.

After living for months in the ideal district of Colorado, New Mexico and Arizona, and studying the weather bureau charts at home, the advantages to be derived from this climate by the tuberculous seem to me absolutely convincing. I believe it is imperative that a philanthropic or national reservation with tent colonies should be established in some part of this locality. Recruiting stations could be opened in the great cities and State sanitoria could send selected cases to the Great Western Tent Mecca. Our government spent millions of dollars in Cuba to drive out malaria and yellow fever for the Cubans and it now seems imperative that it should appropriate moneys for a southwestern reservation for the consumptive.

I am very much indebted to excellent papers by Dr. Waxham, of Chicago; Dr. Denison, of Denver; Drs. Gardner and Solly, of Colorado Springs; to the System of Physiological Therapeutics; to the chief of the U. S. Weather Bureau and his staff of the New York office. I am especially grateful for the courtesy, kindness and encouragement shown me while preparing this paper.

Modified Summary.—In summing up the advantages to be derived from these places by the consumptive, let me impress upon you a few points:

1. Consumptives with a rapid breaking down of lung tissue should avoid high altitudes. So also should those of neurotic temperaments.

2. Those with especially developed cardiac lesions, with a marked tendency to a disturbance of cardiovascular balance, should avoid high altitudes.

3. Those completing the fifth decade, where the capacity of muscular exertion is considerably limited, should avoid high altitudes, although I have heard of many cases being taken to Colorado, recovering and taking up their life there.

4. Laryngeal cases do better at the low altitudes.

HYPNOTISM AND HYSTERIA.*

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IN response to the request of several members of the class, I shall devote the hour to an effort to put you in touch with a working knowledge of the subject of Hypnotism, a sort of fantastic phantasmagoria in the minds of the uninitiated. The medical profession is by no means an unit in its professional estimate of this subject, nor is the lay mind any more unanimous. To the great majority of those who accept as a fact the state or condition known as hypnotism, the phenomenon is so associated with the mysterious, the weird and the uncanny as to leave the student mind in a state of utter chaos as to any tangible or material explanation.

There are many who are ignorant from investigative inaction.

It is instinctive with many to fight shy of the unknown and inexplicable, to let some other fellow go first. We hesitate to enter unexplored territory. A third, perhaps, of the masses, and not a few physicians, are arrant sceptics, denying altogether the existence as a genuine phenomenon of hypnotism in any form or degree. To such sceptics it need only be said *circumspici* "look about you." The most positive and convincing proof is easily at hand, and in limitless abundance. Not to have seen a thing is no evidence of its non-existence.

Much of the mystery which breeds this doubt and this instinctive opposition can be eliminated by a proper method of approach in the study of the subject. Similar, if not essentially identical states, are familiar and accepted in the experience of nearly every one, as, for example, in the transient, dazed state of so-called absentmindedness, in sleep-walking, and in sleep-talking, in states of post-epileptic automatism and in hysterical trance. All these are ecstasic states. For the moment or the hour the individual stands outside himself. To admit this, and it would seem a quod erat demonstrandum, is to accept with clearer understanding what follows. In proportion as one is mentally stimulated by a special idea or thought, all other mental activity is repressed or

* Lecture delivered at the New York Polyclinic.

inhibited or paralyzed for the time, the result being a state of preoccupation or slight trance. The dervishes of Arabia, the fakirs and priests of India, the religious disciples of central Japan, and other orientals develop under certain circumstances, states of self-hypnotism in remarkable degree and profundity. The religious trances and ecstacies of the Southern plantation negroes are identical in explanation and character. The soldier who marches into action to the strains of martial music is hypnotized in a way. The friend who suggests to a friend the doing of a certain thing not previously contemplated illustrates the initial border-line between spontaneous volition and suggestion. These, it may be urged, are all states of self-hypnotism or auto-suggestion. What is the difference after all? It seems to me a case of tweedle-dum and tweedle-dee. If the susceptible individual can, within himself, develop these conditions, why should it not be possible from extraneous suggestion? As a matter of fact, I am not sure but that all states of hypnotism are autogenous, the operator or hypnotiseur simply suggesting to the suggestibility of the subject. The argument is equally tenable that all suggestion or hypnotism is extraneous in origin through extrinsic sense impression, as in the effect of martial music on the soldier.

The phenomenon is not limited to man. The lower animals are exceedingly sensitive. I have seen the late Dr. Landon Carter Gray hypnotize at one seance a rabbit, a frog, a pigeon, a lobster, a canary and a man. I have myself hypnotized frogs, birds, dogs and other animals. The familiar child's trick of stretching a chicken's neck out, bringing the bill to a certain crack in the floor or line in the sand, gently stroking the head or body at the time, then leaving the chicken stretched out unrestrained for several minutes, is an example. The snake charming a bird, the man controlling a wild beast with his gaze, are not necessarily myths, to my mind, both allowing of a quasi-rational explanation in hypnotic influence. Mowglie's control of his fellows of the jungle, as described in one of Kipling's recent publications, quite graphically illustrates this power, although the illustration is lacking in scientific value or force.

Another deterrent influence, of no mean weight in its effect in delaying our knowledge of the subject, is the red flag of danger which has been waved along the line of research in this field. "Much harm can be done to the subject;" "his mental integrity may be seriously impaired;" "his will power utterly destroyed and he himself degraded to the purposes, meritricious and even criminal, of the operator." There is no evidence whatever in support of such doctrines, and very much evidence directly to the contrary.

Hypnotism, beyond question, although very limited in its field of usefulness, has accomplished good; that it has done harm, when legitimately employed, remains absolutely without proof in specific instances. There has been much of empirical damnation. As a result of careful investigation, I am convinced that those who cry loudest Wolf! Wolf! know least about it. In this instance, as in many others, fear is born of ignorance. Employed illegitimately and for ulterior purposes, I am not sure but that its results might be harmful. To put morphine in the hands of the quack or layman, or to give children matches to play with, of course involves danger. The layman has no business handling morphine, and he who puts matches into a child's hands invites trouble. Admitting, for arguments sake, that there is any danger, are we therefore to discard it altogether? If so, to be logically consistent, we should, as Hirt suggests, discard ether, chloroform, opium, strychnine, and indeed, practically all our therapeutic resources. In justice to myself I wish just here to discount the possible charge of enthusiastic faddism. I am no enthusiast. I simply want to see fair play. Quite as much harm has been done in delaying and obstructing a calm judicial adjustment of values, by the optimist as by the pessimist. There are hypnotists "run mad" beyond question—men, who, if they are to be believed, can cure anything from a cold to a carbuncle, by hypnotism. Such enthusiasts possibly have hypnotized themselves. This, at least, is a charitable explanation of their utterly visionary and extravagant assertions. "In medias res tuta est." Somewhere between the two extremes of enthusiastic advocacy and materialistic doubt lies an agent undoubtedly entitled to a legitimate, though limited, place in our useful therapeutic resources. The youth of the subject affords another explanation for our ignorance. Hypnotism proper dates back only some 200 years, ab initio. It was first called Mesmerism. Franz Mesmer was born in 1753. He enunciated the doctrine, in explaining certain phenomena induced by him in susceptible subjects, of a magnetic fluid, atmospherically communicable, from operator to subject, which gave to the former complete control over the volition of the latter. He was a gigantic fakir, scientifically at least, but, as in other instances, some good thing may come out of even such a Nazareth as that. We owe something of value to Hahnemann and even to Mrs. Eddy. Hypnotism proper dates from the writings and teachings of Braid in 1841. Liebault, following Braid, reviewed and further elucidated the subject in 1866. To Bernheim's work, published in 1884, less than twenty years ago, however, we owe more than to any other source, a scientific estimate and systematized elaboration of the subject. Charcot, Richer, Haidenhaim, Forel and others have added much to our working knowledge. Much remains to be done, and effort should be encouraged and not repressed.

Coming directly to the subject and to a résumé of our present knowledge, two important factors present themselves for consideration: First, to what extent does hypnotic power exist in the operator, and to what extent does hypnotic susceptibility or sensitiveness occur in the subject? As to the former, I believe with Hirt and others,

that hypnotic power is primarily quite limited. I believe, however, that it can be acquired by cultivation and self-education quite readily. The hypnotiseur must believe first, in hypnotism. He must have a legitimate purpose in view; he must have self-confidence, which is greatest, of course, when born of experience. Sceptics are incompetent, and to them failure is predestined. Bernheim says that the physician who cannot hypnotize 80 per cent. of his material does not understand his business. This I believe to be an extreme view under any circumstances. Properly interpreted it means simply that Bernheim had had much experience. A certain degree of inconstancy in results must remain, for the reason that the personal equation of both hypnotiseur and subject is itself inconstant. As to susceptibility on the part of the subject there is an extreme divergence of opinion as to groups and classes. How much of this is due to the attendant circumstances surrounding operator and subject is hard to determine. For example, Charcot and Richer held that hysterical subjects were easily hypnotized. American authors and many English and German observers disagree with this conclusion. Charcot's experiments were at the Salpetriere, a hotbed of hysteria amidst a nation of hysterics. The Latin races are peculiarly susceptible to hysteria and to hypnotic suggestion. These facts must be taken into consideration. The racial difference should never be overlooked. Dana, Church and others among American authors, state that children are peculiarly sensitive to hypnotic influences. This I believe to be absolutely at variance with the facts and the principles of the whole proposition. It is universally conceded, whether from experience or acquiescence, that idiots, imbeciles and the weak-minded are insusceptible to hypnotic influence,—on a priori ground, children are equally, or, at least, proportionately insusceptible, and, as a matter of fact, so far as personal experience goes, they are exceedingly difficult subjects. The subject is susceptible or sensitive in proportion to his intelligent understanding of and cooperation with the operator's purpose; he must be without fear of the effects; must have confidence in the hypnotiseur, must be capable, by fixing his mental attention, of a cooperative understanding. There should be the most perfect and frank rapport between operator and subject. Absolute cooperation is not essential in the peculiarly susceptible and educated subject, but as a rule, it is necessary. The percentage of people taken at random from the masses, who are susceptible to hypnotism varies widely from 20 per cent. to 80 per cent. It is necessarily an inconstant and widely variable percentage, because of the importance of the personal equation and relation between operator and subject.

The method or technic varies considerably also, although the salient idea or principle is the same always. Braid's method was to exhaust by fatigue the visual sense, the subject being required to look steadily at some bright object (a coin) held a few inches or feet from the eye,—the distance makes no difference, although certain text-books would lead you to believe that six inches is the limit. Luys used revolving mirrors in a darkened room. Richer employed flashlights, Charcot, flashlights or loud sounds on a gong or tomtom, Bernheim employed the fixed gaze, requiring the patient to look him steadily in the eye, he meantime employing suggestion, telling the subject that he was getting sleepy; that he was asleep, that he could not open his eyes, etc. Stroking the head, face, or limbs is often employed as an adjuvant means to the desired end. The employment of monotonous sounds, as the ticking of a watch, or striking of a gong, is at times successful. Hirt's method of utilizing the psycho-physical effects of electrical sensations in obstinate subjects demands special mention as being both ingenious and practical. Dana, I am told, employs a lighted candle in a darkened room. My friend, Prof. Adler of the Smithsonian Institution, called my attention to the technic of self-hypnotism practised by the llamas of India as illustrated in Kipling's "Kim," where the llama could self-induce a state of subconscious trance by practising a certain method of forced inspiration.

The arbitrary divisions of hypnotism into different stages is, I believe, relatively unimportant. Later on it may prove to be of some technically scientific value, but, so far as therapeutically beneficial results are concerned at present, it seems to be immaterial as to whether the patient or subject is in the lethargic, cataleptic or somnambulistic state. Bernheim gives nine stages of varying degrees of hypnotism. His ninth stage is the only one of practical importance, representing as it does, a state of posthypnotic suggestion by which the subject is kept under the influence of the hypnotiseur when personally absent or separated by either time or distance.

What good does hypnotism do? This is the final and all important question. It has been successfully employed for the relief of various neurasthenic and hysterical obsessions; the phobias, functional disturbances of the senses, anesthesiæ, paresthesiæ, hysterical motor pareses, conditions notoriously difficult of relief by other means. The results attained in these fields suggest an almost limitless possibility of extension. Indeed, its importance as a therapeutic resource lies not so much in what has been done, as in what may be done. There seem to be certain quite positive contraindications to its employment. In the delusional insanities and in organic and toxic nervous diseases, its employment suggests not only an insult to intelligence, but an agency pregnant with much evil. The induction of surgical anesthesia for minor operations, the minimizing of labor-pains in parturition are both accomplished results according to the published reports of reputable observers. The regulation of menstruation and the control of constipation by hypnotic suggestion, claimed by Forel, are suggestive as to the

direction in which the field of application may be ultimately further widened.

Having reviewed the general aspects and principles of the subject, let us see to what extent these principles may be illustrated by example. The patient before you has a most interesting history, which briefly summarized is as follows:

X. Y. Z., aged twenty-one years. Electric work, El. R. R. Cough and dizziness and general bad feeling in Oct., 1902. Consulted one of the staff at Roosevelt Clinic, who pronounced symptoms due to goiter. Told operation was necessary, and if not done he could not live long. Operation done November 7. Goiter removed followed by partial aphonia. Second operation done February 10, on other side of neck, to relieve some cosmetic defect from first operation. Both operations under ether. Total aphonia following second operation, which continues and on the day following he was seized with cramps in legs and arms, feet and hands (typical flexor contractions), also in face. These continued daily for twelve days, when he was given drugs hypodermically to relieve. One week later the contractions returned, but in very short paroxysms. Since then short attacks about every week. On March 26 he had a fit of some kind; "black in face, eyes rolled back, muscles became rigid, unconscious for half an hour or more." Ever since the twelfth day after last operation has had numbness of second finger of left hand, limited sharply at metacarpal joint. Also similar sensation but more peculiar in distal phalanx palmar surface, right thumb, absolute joint limitation also. About sixteenth day after operation, developed area of exquisite painful sensitiveness about size of silver dollar on anterior thigh, left leg, about 1½ inches above the knee. Some swelling apparently, but no fluctuation, redness, etc., and in three days had disappeared, leaving no sign, no recurrence. Has had frequent feeling as of choking, lump in the throat. At times much depressed, and has "spells of breaking down," cries and is very nervous, feels as if he "didn't care for anything," and wants to die. Often lies awake two or three hours on retiring, and often sees visions floating about the room, lights, machinery at work, etc. Several varieties of visual hallucinations, but always knows it is his imagination. Can drink water, milk, ginger ale, and, indeed, anything but tea and coffee, either of which chokes him. Has found a spot just above clavicle and to the left which if touched makes him cough. Concentric limitation of visual fields. The diagnosis of postoperative major hysteria is quite obvious.

He was referred to me by Dr. Dougherty, of Dr. Quinlan's staff. The case seemed to me to be one peculiarly likely to be benefited by hypnotic suggestion. I found the patient an exquisitely sensitive subject, passing readily into the somnambulistic state at the first seance. In this case as in all others, I employed the same procedure. I first explained to the patient what I intended to do, assured him as to the absolute absence of danger or discomfort, and asked his intelligent cooperation. I employed as usual the Braid method. I made no suggestion whatever during the first seance. I try to get first the absolute confidence of the subject. The second time I hypnotized this patient I suggested to him that he would find the left thumb much improved as to the anesthesia; the third time I suggested complete disappearance of the thumb anesthesia, and a diminution of the trouble with the second finger of the other hand. To-day I shall try to get rid of these sensory disturbances altogether. He tells you that the thumb is now all right and the second finger much better. I shall next take his aphonia and gradually, one at a time, shall rid him, I think, of most of his ills. I place him in a comfortable position for a nap. I hold this ophthalmoscopic lens before him thus, three or four feet away, and tell him to look steadily at it, and to go to sleep, that his eyelids are getting heavy, that they are closed, that he cannot open them, that he is asleep. You see him, gentlemen, fast asleep, apparently, at least. I take his hands, put them into various arbitrary positions, tell him he cannot change these positions, and leave him so. Stroking the thumb and finger, I tell him he will find them in a normal state when he wakes up. I leave him in this state of cataleptic sleep or trance for two, five or ten minutes, then touch him and tell him, "That is all," and he returns to consciousness. The patient tells you he was asleep, and yet it was a different kind of sleep; that he heard my voice, but nothing else, and that he felt that he had to do whatever I said, etc.

Note.—I subsequently exhibited this patient before the West End Medical Society, New York City, perfectly well in every respect. Six seances occurred altogether.

105 West Seventy-third Street.

DRY SUPERHEATED AIR IN THE TREATMENT OF SEPTIC INFECTION.*

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ONE of the most dreaded of the pathological states which we encounter with a moderate degree of frequency to-day is septic infection. It is also one of those conditions, which, when fully developed, offers very meager prospects for successful management under ordinary methods of treatment. About the only effective management has been to prevent the accident from occurring, and honor will never cease to be paid to Sir Joseph Lister and those who have followed him in developing the technic of antisepsis and asepsis to the wonderful degree of thoroughness and efficiency, which to-day enables our surgical con-

* Read before the Clinical Society of the New York School of Physical Therapeutics.

freres to accomplish curative feats that would have been characterized as nothing short of absolute magic by the practitioner of fifty years ago.

When septic infection has once gained a foothold in the human system, however, neither antisepsis nor anything else has offered us much in the way of power to extinguish the conflagration, and we have had to go back to the first principles of therapeusis, merely keeping the patient's general condition as good as possible, and hoping that his constitutional vitality would enable him to overcome the invasion. Sometimes when the infection is confined to a limb we can cure the patient by amputating the infected member, and although this is a most distressing alternative for the patient, yet it is better than death, and he will usually consent. But in how large a proportion of cases do we see the infection reappear in the stump two or three days after the operation, to impress us anew with a realization of our helplessness in the presence of well-established septic infection? Therefore, any remedial measure which promises to be helpful in the battle with so intractable a condition as this, deserves consideration and study, and dry hot air promises to exhibit this power in an eminent degree.

When a new therapeutical agent is brought to our attention the first question that naturally arises is "What will it do?" and in considering the therapeutical application of dry hot air with reference to septic infection we find it convenient to divide the cases into three classes: (1) Those in which the infection has taken place in a limb and has not yet invaded the lymphatics of the joint connecting the member with the trunk, and which are nearly always early cases; (2) those in which the lymphatics of the trunk have also become involved, but where the original focus of infection has not yet become so profoundly effected as to demand removal; and (3) those in which the lymphatics of the trunk are involved and the tissues originally invaded are so hopelessly diseased as to demand immediate operative interference. The two last-mentioned classes nearly always exhibit a profound systemic toxemia, as will also an occasional case belonging in the first-mentioned category.

Among thermotherapists the beneficial influence of dry hot air upon the progress of cases belonging in the first-mentioned class of infections is so well established as only to need a mention in order to be appreciated, but as the vast majority of you are not thermotherapists, and as very few of you are at all familiar with the agent in any of its therapeutical or clinical aspects, I will cite briefly the following case, as illustrative of its power in this situation.

Case.—Mrs. F. D. K., twenty-four years old, punctured the middle finger of her right hand with a fork April 16, 1901. The wound showed evidences of infection the next day which rapidly increased, involving the hand and wrist until April 19, upon which day she consulted me about the matter. At this time, the finger, hand and wrist were badly swollen. Red streaks ran up the forearm nearly to the elbow and the lymphatics of the elbow were palpably enlarged. Constant and severe pain was present in the arm throughout its extent. She had not slept for thirty-six hours. Pulse 100 per minute, temperature 103° F. She was given a local hot-air treatment which included the hand, forearm, and up to a point two inches above the elbow, at 400° F. for an hour. The pain was entirely relieved during the treatment and she was told to report again in the evening for another application, which she did. At this time there was no apparent change in the local condition. No extension of the process had taken place, neither was there any evident diminution in the areas involved. The relief from pain due to the first treatment lasted five hours. At this time it was again quite severe. She was given another local application of the same character as the first which again relieved the pain completely. She was directed to come on the following morning for another seance.

She appeared according to appointment. She had slept nearly all night, the swelling had decreased 50 per cent., redness had disappeared everywhere except in the immediate vicinity of the original injury, and the enlargement of the glands at the elbow had decreased in a marked degree. The member was painful only on movement and manipulation. Pulse was 80 per minute. Temperature 99.5° F. She received eight treatments during the next five days. The pain did not return after the treatment on the morning of April 20. The swelling of the hand and forearm and the enlargement of the glands at the elbow decreased steadily and rapidly and on April 25, or six days after the first hot air treatment, she was discharged without a trace of the trouble remaining.

In cases of the second class the therapeutic problem becomes considerably more complicated, but the clinical phenomena are scarcely less striking, and the following case exemplifies very well the results usually obtainable here.

Case.—Mr. G. P. H., thirty-two years old, was brought to the sanitarium March 2, 1901, by Dr. A. S. Cheney of New Haven. Four days previously he had cut his hand with a dirty jack-knife. The usual evidences of infection duly appeared, and when he entered he was in a condition of profound prostration with a temperature of 103.4° F.; respiration 28, but the pulse was only 86. Hand and arm were considerably swollen. Lymphatic glands about the elbow and in the axilla were irregularly enlarged, those in the latter situation to about the size apparently of an English walnut. He was in constant severe pain. The presence of deeply located suppuration seemed probable but was not positively demonstrable. He had been brought in with the intention of operating the next day. It was finally decided, however, to treat him with hot air first, holding operative interference in reserve.

At noon of the day following his admission he was given a body hot-air treatment at 340° F. Perspiration was profuse, the pain was relieved

entirely before the conclusion of the treatment, and he had a quiet, refreshing sleep after he had been removed to his bed. The evening temperature was 102.5°F. as against 103.4° F. of the previous day.

Next morning at 8 o'clock his temperature was 99.9° F. and pulse 84. The patient had slept several hours during the night. The pain had not returned to any great degree, and the prostration and nervous symptoms were greatly lessened. The swelling in the hand and arm was less, as was also the enlargement of the glands in the axilla. He was given another body treatment at noon at 350° F. His temperature was 101.8° F., pulse 80, as against 102.5° F. and 94 respectively the preceding evening.

Treatment was administered again late in the afternoon. Morning temperature the next day was 99° F., pulse 78. Patient had slept at intervals during the night and during the day, resting quietly. That evening his temperature was 100.4° F., pulse 76. Pain and swelling had entirely gone out of the arm but the axillary enlargement persisted as did also a considerable amount of pain in this region.

The following day, March 7, his morning temperature was 99.4° F., pulse 76. In the afternoon he was given a body hot-air treatment at 350° F. and the next day his temperature in the morning was 99° F., pulse 70. In the evening the temperature rose to 100.6° F., with the pulse averaging 88.

At this time palpation of the axillary enlargement demonstrated the presence of pus and it was decided to open the axilla the next day, which was done at four o'clock in the afternoon, Dr. Cheney operating. Upon incision, a large quantity of fluid pus was evacuated and a pocket was discovered running up under the clavicle for a distance of about three inches, of a diameter sufficient to admit of exploration with the forefinger. This cavity was lined with an enormously thickened pyogenic membrane, and *no glands outside of it were involved in the infective process.* It will be observed that this is a very different picture from that usually encountered under these conditions, where the contents of the abscess cavity consist of pus with a plentiful admixture of cheesy detritus which it is not at all easy to remove in a thorough manner, and where gland after gland is found to be infected, necessitating a vast amount of dissection in order that the extirpation shall be complete.

The pyogenic membrane was curetted out and the subsequent progress of the case toward recovery was rapid, satisfactory, and uneventful. On March 13, the body temperature returned permanently to the normal point and he was discharged on March 23, just three weeks after his admission, entirely recovered from an attack of septic infection which was very evidently seriously threatening his life when he entered.

This case illustrates the necessity of combining operative interference with dry hot-air treatments in those cases where such structures as lymphatic glands have become diseased to such an extent that disintegration is inevitable and pus accumulations are present. The immediate improvement in the patient's general condition after the first hot-air treatment together with the strenuous localization of the inflammatory process in the axilla, illustrate the powerful influence of body hot-air treatments in lessening general systemic toxemia, and in preventing the spread of the infection from structure to structure through its power of increasing the constitutional resistance of the cells composing the threatened areas.

The shocking railroad accident, which occurred in the Park Avenue railroad tunnel about a year ago, furnished an illustration upon the person of one of the victims, of what thermotherapy can do in infections belonging in the third category.

Case.—Mr. A. W. A., aged fifty-one years, was admitted to the New York Hospital on the morning of Jan. 8, 1902, with a traumatic amputation of the left foot at the ankle. The crushed member was attached to the leg merely by the lacerated posterior tendons. Patient of course was suffering considerably from shock. Amputation of the lower third of the leg was done by Dr. Francis Marcoe that afternoon. Septic infection, however, declared itself three days after the injury. On January 12 it was noticed that the knee was swollen; on January 15 pus began to discharge from the wound, and in spite of the utmost care the condition increased in gravity until January 23, fifteen days after the original injury. At this time the leg up to the knee and somewhat above this joint was enormously swollen, the tissues of the stump were sloughing in places and the patient's general condition was one of extreme prostration. In short, he presented a typical picture of the severest form of blood-poisoning, except that streptococci had not been found in the blood.

It was decided to amputate the infected member above the knee as a forlorn hope. This was done by Dr. Frank Hartley on the evening of January 23, at the middle of the thigh. He rallied very well from the operation and the next morning was given a body hot-air treatment. During the time intervening between January 24, the day of the second operation, and March 8, the day of his discharge from the hospital, the patient received 13 body treatments, the greater number of which, of course, were given during the two weeks immediately succeeding the amputation of the thigh. His general condition began to show slight evidences of benefit at once in the way of increased comfort, ability to sleep, and improvement in the vital signs, and he continued to gain slowly but steadily, until by February 5 his improvement had become so manifest as to justify a prognosis of recovery with a moderate degree of certainty. From this date on, his improvement was entirely satisfactory, and to-day his general condition is better than it has ever been in his life before, and he weighs as much

within one pound without his leg as he ever did with it.

In order to indicate the gravity of the case I will say here that it was the unanimous opinion of the physicians who saw him that neither the operation nor any ordinary therapeutical measure would save the patient's life. The fact also that slight evidences of tissue disintegration appeared in the wound three days after the second operation, is indicative of the fact that the operation and therapeutical measures other than hot air would not have sufficed to secure a successful termination.

Now, as it has been objected that the beneficial results of hot-air therapy are coincidental and not due to powers inherent in the agent itself, I will say here that this might constitute a plausible theory if those results had been observed in only a few cases, but when they are noted in case after case the conviction finally becomes inevitable that the remedy is the responsible factor, and such has been the course of events in connection with the remedy under consideration.

As far as I know hot air has not been used in a case of septic infection in which streptococci have been found in the blood, but its physiological action indicates that it will be of great assistance in even this ordinarily hopeless condition. Cases of puerperal sepsis have also not as yet been subjected to its influence. There is apparently no reason why we should not be able to get good results in this condition.

The cases recently reported by Dr. Barrows, of New York City, in which streptococci were found in the blood and which recovered under the use of intravenous injections of formalin, suggest most attractive possibilities in the treatment of this grave form of sepsis for the future, and it is most sincerely to be hoped that future experience with the intravenous injections of formalin will justify the expectations which have been raised by these cases.

So much for clinical results. The next question presenting itself for consideration would be "How does the agent produce these effects? What is the physiological modus operandi of the influence which has been observed?" To answer this query, we shall have first to ascertain the physiological action of treatments with dry superheated air, and then to consider the pathology of septic infection with reference thereto.

It will be observed that two varieties of hot-air applications were employed in the cases just cited; one where only the part affected was treated and which is denominated the "local treatment," and the other where the greater portion of the body surface was subjected to influence, and which is denominated the "general" or "body treatment." Although the physiological actions of these applications differ from each other chiefly, as far as septic infection is concerned, in degree rather than in kind, yet we shall find it instructive to consider them separately in connection with the cases just cited, and will give our attention first to the local treatment.

This therapeutical measure affects physiological function in two ways; first, by a direct stimulation of cell metabolism in the part treated due to the raising of its temperature en masse; and second by a reflex acceleration of cell nutrition set up by the stimulating influence of the heat upon the numerous nerve endings in the skin.

It is, of course, not possible to raise the temperature en masse of one portion of the body very much higher than that of another portion, but by placing the bulb of a clinical thermometer at the bottom of a deep sinus and then applying a hot-air treatment, it has been demonstrated that an increase of several degrees Fahrenheit can be induced. This is enough to accelerate oxidation processes very perceptibly, and also to inhibit appreciably the development of most of the common pathogenic micro-organisms.

It has been suggested that the germs in these cases were directly *destroyed* by the heat. This view, however, is improbable, and there is no experimental or clinical evidence available indicating that it is possible to raise the temperature of any portion of the body sufficiently high to produce this result.

Through the reflex influence is obtained an emphatic local hyperemia, which, together with the stimulation of the trophic nerve supply of the part treated, results in greatly increased local nutrition, whereby the vigor of the normal cell resistance to germ invasion is accentuated.

Copious perspiration appears upon the region treated, and in greater or less degree upon the rest of the body, whereby the general circulation is relieved from a certain proportion of the toxin which is impregnating the body fluids.

To the influence upon the circulatory function of the part whereby stasis is relieved, is probably due the powerful influence of dry hot-air treatments in relieving pain and swelling.

The physiological action of the body treatment is predominantly reflex through the spinal sympathetic, the area of skin affected being so great that the capillary circulation is able to dissipate the heat before it penetrates deeply enough to exert its action directly to any great extent, therein differing from the local application.

Microscopical and chemical examinations have demonstrated that the following phenomena are susceptible of immediate induction by the body hot-air treatment. (1) If hyperleucocytosis is not already present the number of white blood corpuscles is increased in different cases from 15 to 50 per cent. If it *is* present, the increase is usually not so great, or it may be entirely nil. (2) The red blood cells are increased from 10 to 20 per cent. (3) The quantity of urine passed in the twenty-four hours succeeding the treatment is usually increased from 25 to 100 per cent. over the quantity passed in the twenty-four hours preceding. In a few instances, however, a decrease in the quantity has been observed. (4) The quantity of urea excreted in the twenty-four hours succeeding the treatment is increased from

15 to 60 per cent. over that excreted in the twenty-four hours previous. These effects persist, with decreasing intensity, for from four to forty-eight hours and sometimes longer.

The general phenomena induced by the body application are as follow: The mouth temperature rises from 1 to 5° F., according to the length and intensity of the application, and the susceptibility to stimulation of the individual patient's deep nerve centers. The pulse is accelerated from 30 to 50 beats per minute and is markedly increased in volume. If it was weak before treatment it now becomes strong. If the application is continued too long it loses its volume and strength, becoming rapid, small and soft. The respiration deepens and the rate increases 5 to 10 cycles per minute, but this modification is not accompanied by any oppression—rather the reverse, in fact. The capillary areas become injected, but this phenomenon is not so marked in the regions actually in contact with the heat as with the local treatment. The fact that the capillaries of the face, which is not subjected to the heat, share this general distention even when constantly under the influence of the breeze from an electric fan, demonstrates the profundity of the reflex obtained. The patient reeks with perspiration, the acidity of which is markedly increased over that normally exhibited.

By this profound stimulation of the deep trophic centers we secure first, a more rapid and complete oxidation of effete materials which are clogging metabolic processes, figuratively speaking, into normal excretory products—urea for the kidneys, CO_2 for the lungs, etc.,—which are then easily disposed of by the appropriate organs; and second, a rapid production of more vigorous and healthier cell elements which are much better able than their predecessors to resist toxemia and microbic invasion. Such being the physiological effect upon the human organism of dry hot-air applications, let us glance for a moment at the pathological conditions obtaining in septic infection, and see whether or not they are such as would logically indicate the induction of these influences. The primary etiological factor consists of the lodgment in the lymph spaces of pathogenic micro-organisms. After this event has occurred, one of two things will happen: (1) What we will denominate the patient's constitutional resistive power, may be intense enough to enable the cells composing the invaded tissue to destroy the infective organisms, in which case nothing further will be heard from them. (2) The patient's normal constitutional vitality may be lowered from some cause, or the resisting power of the tissues attacked may be weakened, as by impairment of the trophic nervous control from injury or shock, for instance, in which contingency the invading organisms find a pabulum suitable for their development, and they multiply with exceeding rapidity, spreading colony after colony into the numerous ramifications of the lymphatic system, until finally millions of noxious toxin producers are vomiting their paralyzing venom upon structures whose trophic processes are more and more overwhelmed until beyond the possibility of spontaneous redemption, thus rendering larger and larger areas of tissue a favorable soil for their further propagation. These poisonous emanations, together with the ptomains, resulting from tissue disintegration, are taken up by the general blood circulation and brought into contact thereby with all the nerve centers and other tissues of the body, whence results the evil clinical picture so harassingly familiar to most of us, as "blood poisoning."

Two important points to be borne in mind in this connection are, first, that when the normal resisting power of a tissue is unimpaired it is probable that it is capable of overcoming any ordinary microbic invasion; and second, that most of the common pathogenic germs require for their propagation that the conditions most favorable to their development as regards the temperature of their environment, etc., be maintained with a moderate degree of uniformity. These conditions exist very nearly to the point of perfection in the living tissues of the human body, and any influence which alters them to any extent would tend to inhibit the growth of the germs in proportion as the alteration was profound. Now, when a local hot-air application is made to a part exhibiting the evidences of septic infection, what is the sequence of events inaugurated thereby? (1) the reflex stimulation of the vasomotor tracts through thermic irritation of the nerve endings in the skin, relieves the fluid stasis in the part, thereby lessening the pain; (2) the nutrition and cell vitality of the part are augmented by reflex stimulation of the trophic nerve supply through the same channels; (3) the raising of the temperature of the part, en masse, disturbs one of the most important conditions, which it is essential should be maintained unimpaired, if the propagation of the micro-organisms is to reach its fullest development: (as we have seen the living tissues of the human body, when exempt from modifying influences, constitute an ideal culture medium); and (4) the integumental emunctories are stimulated to greatly increased functionation. Now the lessening of the pain quiets the patient's nervous system in direct proportion as the relief is complete, thereby conserving his nervous energy, and the relief of stasis insures a plentiful supply of raw material in the form of an augmented blood circulation, out of which new cells may be built up to take the place of the exhausted, worn-out elements; the augmented trophic impulses result in advantage being taken of this increased supply of raw material for the rapid formation of cells possessing a heightened vitality, whereby the resisting power of the tissue is at once greatly increased: the raising of the temperature of the part, en masse, exercises an inhibitory influence upon the development of the colonies of micro-organisms whereby the virulence and quantity of the toxins emanating therefrom are reduced in direct proportion as the inhibition is profound; and the

enormously increased functionation of the sweat glands removes directly, from the parts most profoundly influenced by the intoxication, a certain proportion of the noxious substances which had previously been devitalizing fresh areas of tissue and passing into the general circulation. What is the result? Instead of the destructive process spreading farther and farther into the sound tissues, we find that the cells at the periphery of the infection, which were just beginning to feel the debilitating influences of the approaching destruction, are regenerated and carry on their reconstructive functions with a normal, or perhaps even an abnormal, degree of activity and efficiency, pushing the lines of healthy tissue farther and farther into the diseased areas, until finally the pathological mass is entirely replaced by healthy tissue and the patient has recovered, frequently *without even a slough.* When a collection of pus is present, however, it is necessary that it be evacuated, neither hot air nor any other measure with which I am acquainted being capable of producing absorption. But even when pus is present hot air will strenuously localize the inflammatory action very closely to the abscess cavity, when a stroke of the knife will end the trouble once and forever.

I wish to refer here, briefly, to statements which I have seen that local hot-air applications to localized infections of any sort were dangerous, and very likely to transform a local into a general pathological condition. I have never heard a logical defense of this statement, and I have never heard of an authentic case where there was any satisfactory evidence that such a result was properly attributable to hot air. Further, in the many thousands of such treatments which I have administered myself, and have had administered under my supervision to such cases, I have never, in a single instance, seen the slightest reason to consider that hot air had been guilty of precipitating such a disaster, and I am free to state my entire disbelief in the existence of any cause for apprehension in this respect.

With cases belonging in the second and third categories, the physiological effect of the local treatment will not usually be sufficient to produce a cure, because in these cases foci of infection have appeared in parts so situated that the maximum influence of the local treatment cannot be brought to bear directly upon them. Under these conditions it becomes necessary to call up all our patient's reserve forces, to stir his vital resistance against the invading organisms to its profoundest depths, and the body hot-air treatment enters the therapeutical problem.

With this application we cannot invoke the directly inhibitive influence upon germ development due to the raising of the temperature of the part, that is obtainable with the local treatment. As we have seen when considering the physiological action of the body treatment, the normal mouth temperature is rarely increased beyond 3° F.; this is not enough to appreciably retard the growth of the streptococcus. Indeed, patients very frequently exhibit elevation of temperature to this extent when they enter the apparatus. The greater beneficial power of the body treatment consists in, first, the greater proportion of systemic toxemia which is eliminated through the increased functionation of the skin, kidneys, and lungs, whereby the vital processes are more efficiently relieved of impairment and depression; and second, its gratifying influence in stimulating to renewed vigor of function the deep spinal and sympathetic nerve centers that control tissue reconstruction, and which have been overwhelmed to a greater or less extent by toxin accumulation in the general circulation.

Usually the first indication that the former has taken place, is a lessening of the nervous erythism which becomes manifest immediately after, and sometimes before the conclusion of the first treatment, when the patient frequently falls into a refreshing sleep lasting from one to several hours.

The augmented functional vigor of the deep spinal sympathetic nerve centers is evidenced before the patient leaves the apparatus by the improved character of the pulse, and within twenty-four hours usually, the reinvigoration of the trophic functions is manifested by a marked lessening and sharp localization of the local inflammatory phenomena.

Lack of time forbids my entering largely into the subject of technic, but I wish to say just a word in reference thereto, as the difference between a skilful, thorough application of the agent and the reverse, will not infrequently constitute the difference between success and failure in clinical results. The most prevalent error in the popular conception of the modus operandi of the curative power of hot air, is that it produces its effect merely through the induction of integumental hyperemia, and toxin elimination as represented by the induction of profuse perspiration. This has led to applying the agent at temperatures only sufficiently high to produce sweating, that is from 200° F. to 250° F. By this means elimination has been secured, and very effective elimination, too, but that is all. Now to obtain the best and the permanent curative influences of dry hot air, we must not only induce elimination, but we must also supplement and perpetuate as far as possible the advantage dependent thereon, by augmenting the trophic reconstructive functions whereby we increase the patient's constitutional resistance, and effective stimulation of these processes is not possible unless the higher temperatures, from 300° to 400° F. are used.

One more important point in connection with the technic of the body treatment is that no hard and fast rule as regards the duration of the application or the intensity of the heat employed can be laid down to govern all cases. The susceptibility to thermic stimulation of the nerve centers of different individuals varies greatly, and each must be treated according to the physiological phenomena induced in his particular case at each treatment. Overstimulation is not difficult of induction with many patients, and this

would be nearly if not quite as bad as an inefficient application. In non-febrile cases, and those exhibiting only a low degree of febrile action, it is usually an indication that sufficient influence has been induced when the mouth temperature has been increased 2° F. above the normal, or when the pulse has been accelerated to 120 or 130 beats per minute. In septic infection, however, an abnormally high body temperature and an accelerated pulse-rate usually obtain when the patient enters the apparatus, hence these modifications of the vital phenomena cannot be entirely relied upon here as guides to treatment duration and intensity. The general effect upon the system at large must be consulted, and the instinct which is the result of experience is invaluable. As a rule, however, it may be said that the pulse should not be accelerated beyond 140 beats per minute, and that nausea, giddiness, faintness and other evidences of overstimulation should be carefully avoided.

The third and last phase of the subject which we will consider, relates to the employment of other therapeutical measures in conjunction with hot air. Can better clinical results be obtained by combining other things with this agent than by relying upon it alone? The question may be unhesitatingly answered in the affirmative, and in some diseases other than the one under consideration, very emphatically in the affirmative. In septic infection, however, the other measures which will enter the therapeutical problem are few, and consist chiefly in judicious regulation of the diet, proper regulation of the excretory function of the bowels, preferably by calomel and salines, appropriate surgical dressings where there is an open wound, and the early evacuation of pus and removal of sloughing tissues wherever and whenever they are in evidence. Pain relieving drugs and stimulants will very rarely be required when skilfully applied hot-air treatments are obtainable. Sometimes open surfaces will exhibit sluggish reparative action and refuse to heal, and here the application of the negative pole of the galvanic battery, employing a bare metal electrode and three to five milliampères of current will render most excellent service. Care must be exercised not to use enough current to cauterize, however; the beneficial influence is obtained through electrolytic not destructive action, and the induction of the latter will sometimes retard the curative process. Aside from this, electricity will rarely need to be considered in this affection, when hot air is obtainable.

In conclusion, permit me to say that, although dry hot air in the treatment of septic infection is a "good thing," yet it is not invariably a "dead sure thing." Side-lights, in the form of individual idiosyncrasy on the part of the patient, or variations in the inherent malignancy of different instances of even the same types of infection, will sometimes flash across the scene with an intensity sufficient to embarrass most seriously the exercise of a satisfactory influence on the part of any curative agent. It will alone and unaided, cure many cases; others will require all the remedial resources at our command; and in still others all that we have will not suffice to produce a cure. It is simply a rational curative measure exhibiting a known and constant physiological action, and which, either alone or in combination with other agents manifests the capacity to increase vastly our power to overcome this condition in the majority of cases. It is, therefore, entitled to a prominent position in our armamentarium.

THE SANATORIUM TREATMENT OF TUBERCULOSIS.

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(Concluded from Page 19.)

In describing more specifically the treatment of the individual patient in the institution, as will naturally be inferred, I have chief reference to the methods as employed at the Loomis Sanatorium.

The first procedure necessary upon the admission of a patient is to ascertain, with as much accuracy as possible, his exact condition, not only with reference to the respiratory organs but to the constitutional status in general. For this purpose the patient is placed in the infirmary, and, unless otherwise indicated, in bed. In taking the history and making the examination it has proved most satisfactory to follow a definite plan of arranging and charting the data with as much regularity of system as is consistent with freedom of questioning. I have here the charts of two hypothetical cases which will illustrate better than I can describe it, the order of procedure at the Loomis Sanatorium. Part I is a general summary and cannot be completely filled out until the patient is discharged: it serves to enable one at a glance to gather all important facts with regard to the individual case and from which the annual reports may be most conveniently made up. Part II contains the family and personal history. In this connection it has proved of inestimable advantage to go very fully into the past life, habits and environment of the patient in order to lay out more appropriately the special course to be followed in the given case, besides greatly facilitating future individualization of treatment. Part III goes a little more explicitly into the history of the present illness with the symptomatology below. I would call your attention here chiefly to the subjects: "History of Infection," "First Presumable Evidence of Disease" and "First Demonstrable Evidence of Disease." The careful following out of which has often thrown unexpected and valuable light upon a case.

Part IV contains the first and most important results of physical examination and as you can see is, so far as the chest is concerned, recorded graphically.

Part V is a continuation of physical examination.

Part VI is the temperature, pulse and respiration chart, and gives an eight weeks' record for each chart. Temperature, which is such an important guide in tuberculosis, is taken in the mouth, axilla and rectum until discrepancies can be satisfactorily eliminated, after which mouth temperature alone suffices until some change in régime is prescribed as, for instance, increased exercise, when for a few days rectal temperature is taken as a control.

Part VII serves to record the weights and sputum examinations during residence. In this connection I may say that patients are weighed every fortnight only, always before the mid-day meal and always by net weight.

Part VIII the urinalysis and blood examinations.

Part IX is left blank for recording monthly synopses of treatment and régime employed and the noting of phenomena in a case not provided for in the foregoing sheets.

It often becomes necessary to make a more or less exhaustive examination of the stomach in certain types of tuberculous patients, and the form for such, as you see it attached to these hypothetical histories, is taken from that employed at the University of Michigan Hospital by Prof. Dock.

By means of these charts a very full and clear contemporary history of the case is constantly available upon which to base treatment from time to time and finally from which to draw accurate statistics. From these data gained upon admission the case is classified according to the condition found. Various nomenclatures and methods of classification are employed in different sanatoria; probably Dr. Trudeau's plan is simplest and most commonly used. He divides his cases into incipient, moderately advanced and far advanced. For purposes of future study, however, and with the hope of avoiding some of the pitfalls of statistics I have adopted a little more explicit classification at the Loomis Sanatorium. Like Dr. Trudeau and others, I make three divisions but subdivide each group, thus making six instead of three classes into which a given case may be placed as follows:

Early { mild symptoms / acute symptoms

Advanced { with favorable symptoms / with unfavorable symptoms

Long Standing { fibrosis predominating / ulceration predominating

Upon admission to the sanatorium the patient is at once supplied with the proper receptacle for expectoration and a small printed folder embodying general information and the rules governing patients in the institution. These are worded in the simplest and most intelligible manner; but to guard against misinterpretation or carelessness the head nurse goes over salient points with the patient.

The sputum cup used in the infirmary, or during the period of rest is one, the receiver of which is made of paper and can be burned. Later on, when the patient becomes an ambulant case, a pocket flask is much to be preferred for obvious reasons, and for this purpose I prefer the modification of the Detweiller flask the modification consisting merely in substituting an aluminum for a glass body. These flasks are cleansed and sterilized by a nurse each day in a manner effective and safe, the details of which are unnecessary to consider.

The patient is detained at the infirmary then, until his condition warrants removal to a room in one of the cottages. This is ordinarily a matter of but a day or two. He is still kept however under close supervision, and takes no other exercise than is occasioned by coming to his meals three times daily, extra diets being supplied him at his cottage. If he is much below weight, this life of enforced rest must be kept up until his weight approaches the normal average, unless his gain is unduly rapid, in which case mild exercise is prescribed but always under the most rigid supervision. During this period of enforced rest, which is invariably maintained for the first few weeks of his residence, the patient occupies a reclining chair on the veranda sheltered from the severities of the weather, clad and wrapped with a view to his comfort and, of course, according to the season of the year, for from six to ten hours a day. At night he sleeps with windows wide open and in winter between flannel blankets. Half an hour before he rises in the morning an attendant closes the windows and the room is sufficiently warm to permit of comfortable bathing and dressing. During the early part of this rest period his digestive system receives the attention which it usually demands. Mild purgation is ordinarily required following which a light diet for a few days generally serves to prepare the stomach for the increased work which is to follow. As a routine practice this is very essential.

He is at this time permitted to read, play chess or checkers, or by other means to occupy his mind, provided pulse and temperature be not accelerated thereby. For the purpose of using his arms conveniently in the cold weather and at the same time to secure sufficient protection while at rest there are many devices in the way of specially adapted wraps, sleeping bags and the like. I have tried various of them but the modified steamer-rug (devised and manufactured by the Kenwood Rug Co., of Albany) has given the greatest satisfaction, as it is made with a detachable hood and of a specially prepared wool which, without being in the least cumbersome, I have found to be sufficiently warm for the coldest weather, and very convenient for the purposes desired. This article has the additional advantage of being considerably less expensive than most such special devices.

At the end of a period varying from a fortnight to a number of months, according to circumstances, the patient is ready to be placed

upon exercise. This period is determined by the condition of the pulse, temperature and weight. An average pulse rate of 100 or more while the patient is at rest would contraindicate exercise, as would a morning temperature (per rectum) above 99° F. or an afternoon rise exceeding 100° F. While a failure to increase a remarkably subnormal weight would also be a contraindication.

The first exercise should be prescribed with caution and treated as an experiment. It should consist ordinarily of a measured walk on a level and should not exceed a few hundred yards. If this be found not to excite temperature or materially increase rate of respiration, it may in a few days be extended gradually. Mild[6] calisthenics may then profitably be introduced, limited to those exercises which tend to develop the mobility of the chest. I prefer the three sets of simple movements recommended by Knopf[6] which seem to answer the purpose very well. After this, may come hill-climbing, but always with the utmost caution at first. On the sanatorium grounds should be a series of graded paths of known incline with rest stations at frequent intervals so, that this exercise may at first, at least, be prescribed with exactness. Gradually as the disease approaches arrest and rational symptoms disappear, the close personal vigilance may be relaxed but there should never come a time during the course of his residence in the sanatorium when the patient is without that watchful medical supervision which is the keynote of sanatorium treatment.

He may now extend his exercise considerably with advantage and in those sanatoria which are intended for the benefit of the working classes, this exercise may be diverted into useful and profitable lines. For instance at the Loomis Sanatorium Annex, late last fall, I introduced the plan of giving suitable cases among the male patients the opportunity to do light work on the sanatorium farm under the direction of a skilled farmer. They were carefully watched during the experiment, and while the time was too short to allow of any conclusions being drawn, none but good results followed. We shall repeat the experiment during the next summer and if successful it will be suggestive of a plan to make the consumptive convalescent of the poorer class self-supporting during treatment.

Another experiment with regard to the value of increased exercise in convalescents from phthisis was carried out at the Sanatorium Annex during the autumn. Twenty patients all with quiescent lesions, without rise in temperature and up to, or a little above, normal weight, were selected and divided into two classes of ten patients each, known as "Class A" and "Class B" respectively. In "Class A" there were five men and five women (one more male patient entered this class, but together with two others was obliged to leave the sanatorium before the completion of the experiment).

In Class B there were six men and four women. The experiment consisted in placing Class A on greatly increased exercise (hill climbing) for a period of two weeks, during which time Class B was upon a régime of enforced rest. The following two weeks the conditions were exactly reversed, Class B taking the increased exercise and Class A the enforced rest.

Observations were made of pulse and temperature for one week prior to the test, during the test and for a week following the test. Changes in weight were recorded under the various conditions as were the effects produced upon cough and expectoration.

Following are the tables showing in detail the records of the two classes and the summary:

CLASS A.—PERIOD OF INCREASED EXERCISE.

Case	Period of observation 1902	Weekly Average T. and P.						Weight after test	
		Previous to test		During test		After test		gain lbs.	loss lbs.
		T.	P.	T.	P.	T.	P.		
1	Oct. 16-30	98.7	84	98.1	95	98.	81	1¾	....
2	Oct. 16-30	98.4	98	98.2	84	97.9	86	4½	....
3	Oct. 16-30	99.	101	98.6	91	98.3	84	1½	....
4	Oct. 16-30	98.5	100	98.4	98	98.9	90	....	1½
5	Oct. 16-30	97.9	88	98.4	94	98.3	94	1¼	....
6	Oct. 16-30	98.6	89	98.3	93	98.8	81	1	....
7	Oct. 16-30	98.	80	98.6	98	98.5	98	1½	....
8	Oct. 16-30	98.	90	99.	96	98.3	73	....	¾
9	Oct. 16-30	98.3	90	98.6	95	Discharged		½	....
10	Oct. 16-30	99.5	100	98.4	105	98.6	104	1½	....
11	Oct. 16-30	98.9	100	97.9	110	98.2	104	2½	....
	Average.....	98.5	93	98.3	96	98.3	89		
						Total.....		14¾	2¾

COUGH AND EXPECTORATION AFTER TEST.

Case	Cough	Expectoration
1	decreased	absent
2	absent	absent
3	decreased	decreased
4	stationary	stationary
5	decreased	decreased
6	decreased	decreased
7	decreased	stationary
8	decreased	decreased
9	absent	decreased
10	absent	absent
11	absent	decreased

CLASS A.—PERIOD OF ENFORCED REST.

Case	Period of observation 1902.	Weekly average T. and P.						Weight after test	
		Previous to test		During test		After test		gain lbs.	loss lbs.
		T.	P.	T.	P.	T.	P.		
1	Oct. 30-Nov. 13	98.	81	98.3	99	98.8	100	3½	....
2	Oct. 30-Nov. 13	97.9	86	98.	93	98.5	89	4½	....
3	Oct. 30-Nov. 13	98.3	84	98.6	101	98.6	97	1½	....
4	Oct. 30-Nov. 13	98.9	90	99.	03	98.4	109	2½	....
5	Oct. 30-Nov. 13	98.3	94	98.8	97	98.6	94	2½	....
6	Oct. 30-Nov. 13	98.8	81	98.6	80	98.6	80	....	¼
7	Oct. 30-Nov. 13	98.5	98	98.6	100	98.5	100	....	¼
8	Oct. 30-Nov. 18	98.3	73	98.6	99	98.8	94	1¼	....
9	Discharged Nov. 13								
10	Discharged Nov. 13								
11	Discharged Nov. 13								
	Average	98.4	86	98.5	96	98.6	95		
						Total.....		16½	½

COUGH AND EXPECTORATION AFTER TEST.

Case	Cough	Expectoration
1	decreased	absent
2	absent	absent
3	stationary	stationary
4	stationary	stationary
5	decreased	decreased
6	decreased	decreased
7	decreased	stationary
8	decreased	decreased
9	discharged	
10	discharged	
11	discharged	

CLASS B.—PERIOD OF ENFORCED REST.

Case	Period of observation 1902	Weekly average T. and P. previous to test T.	P.	During test T.	P.	After test T.	P.	Weight after test gain lbs.	loss lbs.
1	October 16-30	98·8	109	98·7	101	98·8	87	6¼	....
2	October 16-30	98·7	96	97·9	86	98·5	80	2½	....
3	October 16-30	98·1	103	98·5	103	98·5	100	1½	....
4	October 16-30	97·8	95	97·5	90	98·2	103	3¼	....
5	October 16-30	98·2	92	98·9	103	98·5	84	1¾	....
6	October 16-30	98·1	94	98·3	99	98·2	89	2½	....
7	October 16-30	98·	95	97·7	96	98·	98	sta'n	ary
8	October 16-30	98·8	112	98·3	119	98·5	127	7¼	....
9	October 16-30	97·7	101	98·9	90	98·2	88	....	1
10	October 16-30	99·1	107	99·	115	98·5	110	¾	....
	Average....	99·3	100	98·3	100	98·4	98	Total.....	26	1

COUGH AND EXPECTORATION AFTER TEST.

Case	Cough	Expectoration
1	decreased	decreased
2	stationary	stationary
3	decreased	decreased
4	stationary	stationary
5	stationary	stationary
6	stationary	stationary
7	increased	increased
8	decreased	increased
9	decreased	absent
10	increased	increased

CLASS B.—PERIOD OF INCREASED EXERCISE.

Case	Period of observation 1902	Weekly average T. and P. previous to test T.	P.	During test T.	P.	After test T.	P.	Weight after test gain lbs.	loss lbs.
1	Oct. 30-Nov. 13	98.8	87	98·7	99	99·1	96	2¼	....
2	Oct. 30-Nov. 13	98·5	80	98·9	90	98·6	93	....	½
3	Oct. 30-Nov. 13	98·5	100	99·1	83	98·8	114	....	¼
4	Oct. 30-Nov. 13	98·2	103	98·2	103	99·2	102	¼	....
5	Oct. 30-Nov. 13	98·5	84	99·	100	98·6	97	2¼	....
6	Oct 30-Nov. 13	98·2	98	98·4	91	98·1	99	1	....
7	Oct. 30-Nov. 13	98·	98	98·3	88	98·2	98	⅜	....
8	Oct. 30-Nov. 13	98·5	127	98·8	120	98·5	123	2½	....
9	Oct. 30-Nov. 13	98·2	88	98·6	99	98·6	88	....	1¾
10	Oct. 30-Nov. 13	98·5	110	98·6	133	98·9	112	3½	....
	Average....	98·5	96	98·6	100	98·6	102	Total.....	13⅛	2

CLASS B.—COUGH AND EXPECTORATION AFTER TEST.

Case	Cough	Expectoration
1	decreased	decreased
2	stationary	stationary
3	increased	increased
4	stationary	decreased
5	increased	increased
6	stationary	stationary
7	decreased	decreased
8	decreased	increased
9	decreased	absent
10	increased	increased

SUMMARY.—CLASS A.

		Period of increased exercises. T.	P.	Period of enforced rest. T.	P.
Weekly average T. and P. prior to test		98.5	93	98.4	86
Weekly average T. and P. during test		98.3	96	98.5	96
Weekly average T. and P. after test...		98.3	89	98.6	95
Total number pounds gain in weight..		14⅞		16½	
Total number pounds loss in weight...		2¼		½	
Cough....	increased.....	–		–	
	stationary.....	1		2	
	decreased.....	6		5	
	absent.....	4		1	
Expectoration...	increased.....	–		–	
	stationary.....	2		3	
	decreased.....	6		3	
	absent.....	3		2	

SUMMARY.—CLASS B.

		Period of enforced rest. T.	P.	Period of increased exercises. T.	P.
Weekly average T. and P. prior to test		99.3	100	98.4	96
Weekly average T. and P. during test		98.3	100	98.6	100
Weekly average T. and P. after test...		98.4	96	98.6	103
Total number pounds gain in weight..		26		13⅛	
Total number pounds loss in weight...		1		2	
Cough....	increased in.....	2		3	
	stationary in.....	4		3	
	decreased in.....	4		4	
	absent in.....	–		–	
Expectoration...	increased in.....	3		4	
	stationary in.....	4		2	
	decreased in.....	2		3	
	absent in.	1		1	

From the latter it will be seen that the average maximum weekly temperature actually fell during and following the test in both classes, while even the pulse was not materially affected. With the weight there was a small balance in favor of the period of enforced rest in both classes, but it must be remembered in

this connection that most of these patients were above normal weight before the experiment was undertaken. In Class A during the period of increased exercise there was a total gain in weight of 14⅞ pounds and a total loss of 2¼ pounds, while during subsequent period of enforced rest there was a total gain of 16½ pounds and a loss of one-half pound. In Class B during the period of exercise there was a total gain of 13⅛ pounds and a loss of two pounds. While during the antecedent period of rest there was a total gain of 26 pounds and a loss of one pound. The effects of the experiment upon the symptoms may be gathered from the tables. It is worthy of remark, however, that in every instance the patients *felt better* during the period of increased exercise.

It is hardly necessary to add that all patients on exercise should be advised to rest, and in cases of recent activity to recline both before and after meals particularly with respect to the hearty meal of the day. This is an invariable rule in the German and Swiss sanatoria with which I am familiar and I believe it to be a good one.

The diet of the tuberculous patient is, of course, a matter of vital importance. There can be no hard and fast rules, however, applying to all cases alike. In a general way it will be determined by the amount of weight lost in a given case and the type of fever present. In the acute stage of the disease a heavy proteid diet would be as much out of place as if the case were one of typhoid fever. During this period liquid foods should predominate, but as the temperature subsides and the acute symptoms disappear, best results undoubtedly follow a return to the more normal relations of the various elements of a mixed diet, with this exception that the proteids should be largely increased both relatively and actually.

With the ordinary patient, unless weight is far below normal, three hearty meals per day suffice to produce a gain of from one to five pounds per week during this life in the open air until the individual average is approached, when gain will naturally be less rapid.

In cases where response to treatment is sluggish, the regular meals are supplemented by additional diets at stated intervals, consisting usually of milk, eggs, broths, cocoa, etc., prepared in various ways according to individual tastes. Forcing diet beyond the point of comfort is, in my experience, an unwarrantable practice and is almost surely to be followed by anorexia dyspepsia, nausea, diarrhea and other abdominal symptoms. On the other hand if the patient merely has a disinclination for food without evidence of tuberculous lesion in the digestive tract, "gavage" may be practised for a time, and as you know with astonishingly good results in certain cases. There is this advantage in "forced feeding," the stomach which has heretofore revolted at any considerable amount of food ingested in the ordinary way, accepts the introduction of large amounts via the tube, and in a surprisingly short time the patient is enabled to take his food by the natural process.

With regard to the diet of quiescent cases, I have ascertained by experiment at the Loomis Sanatorium Annex that which gave the most satisfactory results by placing six selected patients at a table by themselves and carefully weighing all food consumed for a period of one week and averaging the amounts of each constituent per day per patient. The results of my experiment correspond very closely to those obtained by Bardswell, Goodbody and Chapman in the sanatorium wards of Brompton Hospital.[7]

The following table shows the comparison between the diets at Brompton and the Loomis Sanatorium Annex:

	Loomis Sanatorium Annex.	Brompton Hospital.
Soups	5.5 ounces	0. ounces
Cereal	3. "	0. "
Meat and Eggs	9. "	8. "
Bacon	0. "	2. "
Vegetables	12. "	6. "
Bread	8. "	7. "
Butter	1. "	3. "
Milk	62. "	48. "
Cocoa	4. "	0. "
Sugar	1.5 "	1. "
Dessert	2.5 "	3. "
Fruit	6.2 "	0. "

During this week the average gain in weight per patient at the Loomis Sanatorium Annex was 1.3 pounds. It will be seen that the diet at the Loomis Sanatorium was somewhat larger than that at Brompton, but in both cases they were found to be eminently satisfactory.

A word must be said on the employment of hydrotherapeutics in sanatorium treatment of this class of invalids. It has been proved very conclusively that tubbing for the reduction of temperature in septic cases of tuberculosis not only is of little avail but is absolutely disastrous, and in the sense that cold baths are valuable in typhoid, they have no place in phthisis therapeutics. On the other hand, tepid sponging or employment of the wet pack during the hyperpyrexia of acute or advanced phthisis is to be recommended and in infirmary practice at the Loomis Sanatorium has proved the only useful adjunct to absolute rest and proper feeding in controlling the fever.

Alternate hot and cold douching, under pressure, the shower, spray and other refinements of "water treatment" have a definite and considerable value in quiescent cases when elimination is deficient, and the appetite and digestion imperfect, and as a feature of sanatorium treatment therefore a hydrotherapeutic equipment is essential in the institution.

Occupying the mind of the patient with agreeable, healthful and not too stimulating diversion becomes one of the many problems in the sanatorium. In our climate during the summer, the

wealth of outdoor amusement is such that no difficulty is experienced in the selection of suitable recreation. For ambulant cases croquet, when played as Knopf suggests, with long handled mallets, answers the purpose very well; golf is a most appropriate and healthful amusement, though until the disease is completely arrested the full swing should be strictly forbidden and only the short plays allowed, quoits, outdoor bowling and archery practice have from time to time been popular among the patients of sanatoria and are unobjectionable. Driving, walking and hill-climbing are, however, with us the staple outdoor amusements. In winter the list of possible open air diversions is more restricted. An attempt has been made this winter at the Loomis Sanatorium to introduce some of the Swiss and Canadian amusements, such as skiing, snowshoeing, skating and coasting, so far with only favorable results. In any case, however, winter or summer, a constant vigilance must be maintained to prevent dangerous excesses. The physician must indeed live with his patients—indoors and out-of-doors—and maintain that watchful supervision without which the sanatorium wherever situated whether in the high Alps, the Rocky Mountain plateaus or at the seashore, is an utter failure.

I have purposely not entered upon many very important questions of institutional management and administration, because significant as they are, they do not directly pertain to a discussion of sanatorium treatment. For instance the sanitary arrangements, disposal of sputa and other excreta, disinfection of apartments, bedding and clothing, sterilization of dishes and eating utensils, supervision of the laundry, water supply and innumerable other matters of the utmost importance to the successful management of the sanatorium, but which would divert present discussion from the subject assigned me.

Finally, to sum up in a word, sanatorium treatment of tuberculosis consists in placing the patient in the best possible environment to effect an increase in resistance and to counteract the effects of toxins and waste. To accomplish which we must secure to him, (1) An increased amount of sunlight; (2) enforced rest in the open air day and night; (3) increased consumption of proteids; (4) accurately governed exercise; (5) constant and unremitting medical supervision.

If these desiderata can be successfully secured to him at his home—well and good—so much the better, but from an experience of more than fifteen years in private and institutional practice, with chief interest always centered in the difficult questions of phthisio-therapeutics, I have but rarely seen in the home those fortunate conditions which would allow of anything approaching in value, the benefits of the sanatorium to the consumptive patient, and in conclusion I can but reiterate that whatever in the future may be in store with regard to the therapeutics of tuberculosis, the methods of Brehmer must always hold a place and a vitally important place in the treatment, care and education of the consumptive.

I desire to here acknowledge the valuable aid of my assistant, Dr. William J. Hammer, in looking up and formulating references employed in preparing this paper and in his enthusiastic assistance in carrying out the experiments quoted.

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MEDICAL PROGRESS.

MEDICINE.

Blood Cultures in Lobar Pneumonia.—In a recent investigation the attempt is made to establish more definitely the frequency and time of general pneumococcus invasion of the blood stream and the diagnostic and prognostic value of blood cultures in lobar pneumonia, and also to study the agglutinating and bactericidal actions of pneumococcic blood serum. Eighty-three cases were studied, and positive results obtained in 77. E. C. ROSENOW (Medicine, June, 1903) concludes from these experiments that the pneumococcus can be recovered from all cases, if large quantities of blood are used for inoculation, and in obscure cases may be a point of diagnosis of positive value. He agrees with the usually accepted opinion, that pneumococcemia in pneumonia is of no special prognostic value. On account of the difficulties involved, agglutination of the pneumococcus is, at present, of scientific rather than of practical value. Normal and pneumonic blood and serum appear to have no bactericidal influence on the pneumococcus. The interesting question whether lobar pneumonia is the primary result of a direct local infection of the lung, or of a secondary localization in the lung of pneumococci in the blood, is as yet hardly ripe for final discussion.

Effects of Rest in Bed in Phthisis.—The favorable effects of rest in bed on the fever of phthisical patients are explained by PICKERT (Münch. med. Woch., May 12, 1903) on the ground that the horizontal position assumed, produces circulatory conditions in the lung, which resemble the congestion hyperemia in bone tuberculosis. In the latter instance this phenomenon is known to have a favorable effect. If this theory is correct, the fever ought to return or be increased, whenever the lungs become anemic. Observations have shown that if patients who have been kept in bed until the fever had about disappeared, were permitted to remain up for a certain length of time, the temperature would be immediately increased. The amount seemed to depend to some extent on the fact, whether the feet were allowed to rest on the floor, or kept in a horizontal position. In the former case, the venous hyperemia in the lower extremities undoubtedly produced a diminution in the quantity of blood in the upper parts of the body. Systematic trials showed, in fact, that the difference amounted at times to 1.5° on those days when the patients had assumed the erect posture.

The Prophylactic Value of Urotropin in Typhoid.—In a certain number of cases of typhoid, there is a more or less marked excretion of typhoid bacilli in the urine. Urotropin has been employed in a number of

instances, but was found merely to inhibit the growth of the bacilli, and not to cause their disappearance. E. FUCHS (Deut. Arch. f. klin. Med., Vol. 76, No. 1) has lately made some further experiments to determine its prophylactic value. The excretion of the bacilli begins just before or shortly after defervescence, and should continue well into the period of convalescence. The cases observed were divided into two groups, the first included 75 in which no prophylactic measures were attempted. In 16 per cent. typhoid bacilli were found in the urine. In 40 cases 2 grams of urotropin were given daily during the time above indicated, and in only one case, and that a severe one, were any bacteria found in the urine. The author explains the action of urotropin in these cases as follows: In a certain number of instances typhoid bacilli find their way into the circulatory stream and are excreted by the kidney. During their stay in the urinary passages they may multiply and become encysted in certain localities, preferably the pelvis of the kidney and the bladder, and remain quiescent for a long period. Urotropin administered at this time has no effect, as its action is entirely an inhibitory one and does not reach the encysted bacteria. However, if the drug is administered before this can take place, further multiplication is stopped and the remaining germs are excreted. The author is convinced from his experience that the prophylactic use of urotropin in typhoid will absolutely prevent the appearance of the germs in the urine.

Axillary Adenopathy and Incipient Tuberculosis.—The importance of axillary adenopathy in the diagnosis of incipient pulmonary tuberculosis was first pointed out by C. Fernet in 1899. According to this author, the condition is present in one-third of the early tuberculous cases; and Allard in 1901, observed 13 cases, within a few months, in which two to three enlarged glands were present either at the apex of the axilla or upon its internal wall. S. CERAULO (Gazz. Osped., May 24, 1903) has made a study of the clinical value of this sign in 11 cases in which there was strong reason for suspecting incipient pulmonary tuberculosis. Bacilli were present in the sputum of two of the cases studied. Enlargement of the axillary glands was found in but one case out of the total number. Ceraulo considers cardiac palpitation and phosphaturia of far greater importance in the diagnosis of incipient tuberculosis; the former having been present in seven cases out of 11, and the latter in nine. These two symptoms, accompanied by fever, cough, etc., he holds to be highly suggestive of incipient pulmonary tuberculosis.

Arrest of Tuberculosis by a Secondary Infection.—A contribution to the solution of the question concerning the possibility of the arrest of pulmonary tuberculosis by a secondary infection is made by T. SILVESTRI (Gazz. Osped., May 24, 1903). The author reports two cases of undoubted pulmonary tuberculosis—the diagnosis having been confirmed by bacteriological examination of the sputum—in which a permanent cure followed what he believes to be a secondary streptococcic infection. This was marked by chills, high fever, headache, delirium, lumbar pains, epistaxis, nausea, hemorrhagic mocules upon the entire body, nemoglobinuria and blood-streaked feces. These symptoms persisted about fifteen days in both cases; and after their subsidence, a noticeable improvement was observed in the lungs, expectoration, cough and general condition; and at the end of three and four months respectively, a complete cure of the pulmonary lesion was seen in both cases, and the cure has been a permanent one. Examination of the blood was not made, but the author believes the secondary infection to be streptococcic; and bases this belief upon the findings of Haushalter and Etienne, which indicate that the hemorrhagic manifestations in variola, scarlatina and other exanthematous diseases are due to streptococcic infection. He attributes the healing of the pulmonary lesion to a modification of the soil by the secondary infection, which rendered the fertility and vitality of Koch's bacillus impossible.

Laryngeal Spasm and Pseudomeningitis from Ascaris Lumbricoides.—Two interesting cases are reported by G. PIERANTONI (Gazz. Osped., May 31, 1903), the first presenting the symptoms of laryngeal stenosis, the second those of meningitis. In the first, papillary mydriasis suggested the presence of ascarides, and upon administration of santonin and calomel followed by rectal injection, there occurred emission of ten ascarides, after which there was a complete subsidence of dyspnea, and no return of the spasmodic laryngeal attacks. The second case presented a perfect clinical picture of meningitis, though no focus of infection could be discovered. It was thought that the trouble might be attributable to auto-intoxication from the gastro-enteritis present, possibly combined with helminthiasis. Again administration of santonin and calomel was followed by emission of numerous ascarides and subsidence of symptoms. The author emphasizes the value of mydriasis as an indication of the presence of ascarides. Of special significance was this symptom in the second case, as it was present in the period of excitation, at which time myosis is seen in true meningitis. Pierantoni believes with Dematteis, who caused the death of rabbits by injection of an extract of *Ascaris lumbricoïdes* and reported the pathological findings in the animals post mortem, that these parasites secrete a toxic substance and to that are due the anemic and nervous symptoms seen in helminthiasis.

Variations in the Liver.—In the healthy subject, percussion reveals a variation in the lower limit of liver dulness amounting to two or three centimeters in one day, according to the conditions of the examination, such as the fasting state, before or after exercise, etc., writes C. MONGOUR (Jour. de Méd. de Bordeaux, May 31, 1903); and in gastro-intestinal affections and other diseases, notably in typhoid, the author has noted variations in the volume of the órgan amounting to 4 or 5 cm. within a day. The variations in the liver's size in saturnism, alcoholism and cirrhosis of the liver have been carefully studied by Mongour. In saturnism and alcoholism, he found that during the first ten to fifteen days the liver remained unchanged in size; then succeeded a period of progressive augmentation of volume lasting about three weeks, at the end of which time there began a gradual decrease in volume, though the organ never entirely regained its original size; and from that time on it underwent the daily, normal variations of the healthy liver, this condition being reached after a cure was affected. Out of four cases of so-called atrophic cirrhosis with ascites, the lower limit of the liver remained unchanged in three patients after tapping of the fluid, and these succumbed to the disease; while in the fourth, the liver measured 7.7 cm. after the first tapping, 15 cm. after the second and 17 cm. after the third and last tapping; and from this time on, the liver maintained an average of 14 cm. A cure of three years' duration is reported. In favorable cases, a decrease in the size of hypertrophic livers, followed by daily normal oscillations, after withdrawal of ascitic fluid, was also seen. From these findings the author concludes that such variations in the volume of the liver during the course of a given disease are of great importance in determining the functional value of that organ, and are an indication of the suppleness of the parenchyma and of its power to adapt itself to the

needs of the organism under the variety of conditions which influence its function.

Poisoning by Lysol.—Considering the almost universal use of lysol in obstetrical practice, it seems remarkable that more cases of poisoning are not reported. F. HAMMER (Münch. med. Woch., May 26, 1903) believes that such cases are not rare, but as the symptom complex attending them is little understood, their diagnosis is not a simple matter. He reports one case where, on account of the presence of fever during the puerperium, an intra-uterine douche of lysol (1 per cent.) was given. The patient had a placenta previa. Immediate collapse took place, and, although the woman rallied, another collapse with death followed on the tenth day. An autopsy was done and the author explains the case as follows: As a result of the intra-uterine irrigation, a quantity of the lysol solution was aspirated into a vein, some of which reached the brain and caused collapse, but from which the patient rallied. Part of the solution remained in the vein, causing an erosion of the vessel walls and leading to the formation of a thrombus. The latter gradually extended and finally caused death. The author also carried out some animal experiments, by injecting solutions of various strengths under the skin in mice. The results confirmed the observations made at the autopsy of the woman detailed above, and led to the caution that when this drug is used for intrauterine irrigations, it must be used in very weak solution. Any marked degree of pressure must also be avoided, especially in cases of placenta previa, on account of the more gaping condition of the veins.

Colon Infection Simulating Typhoid.—It is now possible to distinguish between typhoid and paratyphoid infections, although the clinical course of the two diseases may be very similar. The question arises whether there may not be a type of disease resembling these, but produced by an organism closely simulating their specific bacilli, namely the colon bacillus. The blood serum of animals infected experimentally with different varieties of the colon bacillus will cause it to agglutinate promptly. There seems to be good reason to believe that in certain forms of pyogenic colon infection the specific reaction with the colon bacillus has been obtained, but owing to the great variability in this organism, the results have been very confusing. J. EVANS and J. SAILER (Univ. Penn. Med. Bull., June, 1903) report a case of this kind, of continued fever, in which the blood did not react to either the typhoid or the paracolon bacillus, but where the disease was actually due to a general colon infection. The patient appeared to have an ordinary attack of typhoid, but the blood constantly showed a negative reaction with the typhoid bacillus. The same result took place with the *Bacillus paratyphosus*. Tests were then made with cultures of *Bacillus coli communis* with a positive result, agglutination taking place even in a dilution of 1:100. All sources of error were carefully considered by the authors and they conclude that the case was one of pure colon infection. A direct blood culture was not made.

SURGERY.

Auto-epidemic Skin-grafting.—A very convenient and seemingly efficacious method of skin-grafting is described by H. F. MCCHESNEY (Med. Rec., June 13, 1903). After the area has been gotten into a healthy condition it is cleaned off with Tiersch solution and then irrigated with normal salt-solution. The surface is dried with gauze sponges and where granulations are firm and healthy grafts are applied directly. If exuberant, they are cut down and where flabby they are cut away till a firm fibrous foundation is reached. Then the thin blue line of epithelial cells that have started to creep in along the edge of the wound is dissected up and small pieces about an eighth of an inch square are cut off and placed on the granulating surface already prepared. These are placed with the raw surface against the newly prepared surface and covered with pieces of oiled silk protective about an inch square. These newly developed epithelial cells are very active in their growth and the grafts take very well. At each dressing new islands may be started with very little discomfort to the patient.

Excision of Tongue.—One of the most remarkable series of cases of major operations is that reported by W. WHITEHEAD (Practitioner, May, 1903), who described his operation for excision of the tongue in 1891 and cited 139 cases, upon whom he had operated with only three deaths. He has since operated upon 50 more cases without any deaths. These patients include only those in whom the growth was confined to the tongue. In regard to the differences of opinion among surgeons relative to the method of excising the tongue, he says that there are four principal disputed points: (1) Division of the jaw; (2) the use of the écraseur; (3) preliminary tracheotomy, and (4) preliminary ligature of the lingual arteries. Division of the jaw he considers unjustifiable because of its great danger and because of its needlessness, even when the glands are removed. The use of the écraseur is a notable example of deviation from the common principles of surgery and the instrument should never be employed. Since the operation which he recommends guards sufficiently against the air passages being invaded by blood and septic materials he never advises a preliminary tracheotomy and maintains, furthermore, that the mortality from this preliminary operation is even greater than from excision of the tongue. Preliminary ligature of the lingual arteries is also held to be unnecessary for the average surgeon can more easily secure the arteries in the mouth than in the neck. In describing his method of operating he lays much stress upon the position of the patient, which should be such that a change from an upright to a horizontal position may be secured at a moment's notice. He always uses an ordinary rocking chair with high back and the patient's shoulders are fastened to tne back of the chair by a towel passing under the arm and over the shoulder, but not across the front of the chest. Any desired position of the body can thus be obtained quickly without any embarrassment of respiration. The tongue is first seized with a pair of forceps and a strong ligature passed through it for traction which is very important. The frenum is then divided by scissors and one blade slipped under the mucous membrane at this point and carried along the floor of the mouth on one side to the pillar of the fauces when the scissors are closed. The same is done on the other side when the whole tongue is to be excised and when the anterior pillars are cut nearly the whole tongue can be pulled out of the mouth, and there need be little fear subsequently of blood getting into the air passages. If the operator is then afraid to cut further with scissors or scalpel he may use a blunt dissector from this point on, by which the tissues may be broken down and torn asunder, exposing the arteries and nerves. The arteries should be clamped, the distal end cut and the stump twisted. If there is no immediate bleeding subsequent hemorrhage need not be feared. Having twisted each artery, he advises that a loop of a strong ligature be run through the stump to prevent its falling back too far when the tongue is finally removed. It is also of service in case of secondary hemorrhage, a very remote contingency. Complete separation may be done by snipping or twisting. After the bleeding from the vessels has been stopped and the floor of the mouth dried as much as

possible, a varnish should be applied to the floor of the mouth. He uses an application made by substituting for the spirit ordinarily used in the preparation of "Friar's balsam" a saturated ethereal solution of iodoform, adding one volume in ten of turpentine. The patient is thus able to take liquid nourishment almost immediately after the operation. The patient should be propped up in bed during the first night and should be encouraged to get up on the second or third day. As a sound principle in surgery, it is always desirable, where malignancy is suspected, to expose as far as practicable the whole area of associated glands and to remove every visible particle of fat and gland just as we proceed to clear out the axilla in mammary cancer. It is a well-known and encouraging fact that in cancer of the tongue death generally takes place before dissemination has extended beyond the limits of the cervical glands—that in fact up to the very end, the extent of the disease is within the range, if not the possibility, of surgical eradication.

Cancer of Lips.—An excellent series of articles upon epithelioma of the lips and tongue appears in the Practitioner, May, 1903, and in one of these T. STOKER shows that cancer of the lip has been gradually increasing in frequency during the last decade. He does not believe that heredity is at all an important factor in etiology but lays a great deal of stress upon the use of the clay pipe so common among the poorer classes of Ireland, where this affection is most frequent. This disease is rare among non-smokers. Furthermore the cancer usually appears on the side on which the pipe is held and in one very unusual instance of cancer in the middle of the lip it was found that it was the habit of the patient to hold the pipe in the center of his mouth. It is doubtful if syphilis is of any importance as a predisposing cause. The great bulk of cases are in persons over fifty years of age. It is practically never seen in persons under thirty. The freedom of women from cancer of the lip is notable, but this depends undoubtedly not upon the sex but the habit of smoking, which is so rare among them. The upper classes are also comparatively free from the disease, a fact which is explainable by their greater care of their teeth and mouth, but especially because they use a pipe, if they smoke one at all, not made of clay. The clinical course is tolerably definite, spreading to the lymphatic glands below the jaw and later down the neck. The salivary glands are not affected till late and it is very unusual for the tongue to become cancerous, secondary to the lip. In fact, metastatic growths may be looked upon as unknown, death from exhaustion, septic disease of the lungs or hemorrhage, preceding their possibility. The only two conditions to be confused with epithelioma in diagnosis are sarcoma and syphilis. The former, if seen early, will be found to have commenced in the substance of the cheek. It is a rare condition. If the history and examination does not make a case of syphilis clear, a short course of mercury will be conclusive. The only justifiable treatment is thorough excision as early as possible. Since, however, the only secondary manifestations are found in the glands of the neck till rather late in the disease one should not despair too early, even when the disease has become extensive. Operations have been done for recurrences several times with ultimate success.

Status of X-ray Treatment of Mammary Carcinoma.—The general desire among physicians to find some more certain and less hazardous method of treating cancer of the breast than radical extirpation, has undoubtedly led many to speak too enthusiastically of this means of eradication. W. J. MORTON (Med. Rec., May 30, 1903) does not believe that the improvement is so constant or so certain as many have seemed to indicate. In the earlier stages, especially when the growth is not deep, the disease is frequently successfully combated. In recurrent cases or in extensive involvements a cessation of growth or even temporary retrogression may be induced but a complete cure is very seldom seen. He urges, however, the use of the X-ray in the earlier cases, for even if a complete cure is not obtained no time has been lost, for the disease may thus be held in check for some time and the outlying fresh areas are easily cleared up. The case is therefore in better condition for the operation and the chances of complete cure are increased. Even in the hopeless and inoperable cases the treatment is justifiable not only on account of the moral effect, but also because of the undoubted prolongation of life, relief of pain and, at times, of an apparent permanent improvement.

Hypodermoclysis in General Surgical Infections.—The beneficent effect of hypodermoclysis in general infection is emphasized by G. TOMASELLI (Gazz. Osped., May 31, 1903) in his description of a case of acute osteomyelitis which had its origin in a severe traumatism and which became the focus from which a general infection spread. The condition of the patient gave little hope after local intervention; profound depression, hyperthermia, small frequent pulse, profuse diarrhea, erythmatous and hemorrhagic eruptions upon the skin, grave changes in the blood and numerous bacteria in that fluid, all pointed to a fatal issue. Incision and drainage of the medullary cavity brought about no improvement in the clinical symptoms; and, hyperthermia persisting, recourse was had to abundant injections of artificial serum. Two hypodermic injections of 500 c.c. each were given in one day and a third, of the same quantity, was administered the following day; after which there were slight remissions of temperature and a lessened depression was apparent. A fourth injection, upon the following day, was followed by marked improvement ;and a gradual disappearance of the symptoms of general infection ensued. Cultures from the blood, taken ten days after the last injection, no longer showed development of bacterial colonies and the patient made a complete recovery, which, the author believes, is largely due to the favorable influence upon the general condition of hypodermoclysis.

Therapeutics of Artificial Venous Hyperemia.—The attempt to influence local tuberculous processes by producing an artificial hyperemia was first suggested by Bier in 1892. Some further trials of this method are reported by HABS (Münch. med. Woch., June 2, 1903), who used it in over 300 cases, about 200 of which were tuberculous. Chronic inflammations of the joints of the knee, hand and foot were markedly benefited and in many cases the swelling entirely disappeared. This was especially noticeable in children, and the pain and spasm often subsided after a few applications. In other cases the condition grew worse and operation became necessary. The methods employed in the various diseases were as follows: In tuberculosis the constricting elastic bandage was applied during the first week twice daily and allowed to remain in place four to five hours. After this it was applied less day by day, until it was in use only one hour daily. Active hyperemia (hot air, etc.) was not used, but injections of iodoform were given in the presence of joint effusions or unopened abscesses. Large abscesses were incised and fistulæ curetted. In advanced cases, resections are of course indicated. In gonorrheal rheumatism, the elastic bandage should be left in place at least eight to twelve hours daily. After the fever and the pain have subsided, in addition, active hyperemia is employed for the absorption of effusions—a daily session of an hour in the hot sand or electric light bath. In cases of chronic joint adhesions follow-

ing trauma or inflammation, the bandage is applied twice daily for an hour, in addition to massage and exercises, and a hot air bath every third day. For joint inflammations due to chronic rheumatism, he prefers active hyperemia, by the hot air or the electric light bath. For incomplete callous formation, aside from massage and exercise, the passive hyperemia may be used for two hours daily. Freezing, frost-bites and the like are benefited greatly by the application of the elastic bandage twice daily for one to two hours. The method can be recommended for simplicity, painlessness and general utility.

Talma's Operation for an Adherent Pericardium.—A case of this type, which was finally succeeded by a general ascites, and in which ordinary methods of treatment were of no avail, is reported by P. CLEMENS (Münch med. Woch., June 2, 1903). As numerous instances are on record where benefit followed this operation in ascites due to hepatic cirrhosis, the patient as a last resort was subjected to the same procedure. The operation was done by Kraske under the Schleich method of infiltration anesthesia, and the omentum sutured to the abdominal wall in the usual manner. An improvement was noted for a time, but permanent relief was not secured. The author believes that failure in his case was probably due to the late date at which the operation was undertaken and also to the advanced cardiac lesion.

The Abdominal Belt.—A plea for the abandonment of the abdominal belt after celiotomy is made by M. KAHN (Phil. Med. Jour., June 6, 1903). He claims that the prevention of postoperative hernias depends to a large extent on the perfect approximation and suturing of the edges of the wound. The strength which it is necessary for the muscles to acquire cannot be gained by any supporting or restraining belt, but must be secured by proper exercise. The wearing of a belt relieves the muscles of their usual labor, and there supervenes the atrophy on non-use, whereas it would be desirable to have the hypertrophy of overuse. When the belt is discarded, the attenuated muscles are suddenly called upon to accomplish what is relatively an excess of labor. The author removes all dressings three or four days after the patient is up, sixteen to eighteen days after operation. He has had good results in all cases.

The Administration of Ether by the Drop Method.—A further report on this procedure, first suggested by Witzel, is made by F. BERNDT (Münch. med. Woch., May 19, 1903), who employed it with success in 120 cases. The injection of a small dose of morphine was recommended previous to beginning narcosis, but this the author has discarded as unnecessary. The ether is given in such small amounts that after-effects are not seen. In all cases the urine was examined for several days without finding a trace of albumin. The recovery in every instance was rapid. The method is briefly as follows: The patient is directed to count backward from 200, so as to stimulate deep respirations. The ether is then dropped very slowly on a Schimmelbusch or Esmarch mask, and after a certain degree of narcosis is attained, taking from ten to twenty minutes, a few drops of chloroform are given until the corneal reflex is abolished. The ether is then resumed and the chloroform may also be again given, a few drops at a time, whenever the patient appears to become restless. The patient's head should be kept low and bent sharply backward. When the chloroform is added, it is claimed that the heart is already stimulated and strengthened by the ether and so better able to resist the effects of this drug.

Cocaine Herniotomy.—In order to lessen the mortality for this operation in every way possible, and minimize the fear of serious results which seems so general among the lay people, it has been suggested and during the last year or more many surgeons have proven that the operation may be successfully performed under a local anesthetic. A. LYLE (N. Y. Med. Jour., May 30, 1903) has performed 15 such operations, and now uses the local anesthetic by preference, even when there is no contraindication to ether or chloroform. After cutting down upon the aponeurosis of the external oblique, the fibers of which may be easily separated, the iliohypogastric and ilio-inguinal nerves can usually be easily found and two or three minims of a quarter of one-per-cent. solution of cocaine should be injected into the trunks. If the genital branch of the genito-crural nerve can be found that, too, should be cocainized. The operation may then be proceeded with without pain to the patient and a thoroughly radical operation performed. Care should be taken not to cut any good sized blood vessels, for there is always pain on ligating such a vessel unless the parts are thoroughly anesthetized. The cocaine solution should be fresh, hot, and sterile. The advantages claimed for this method are: (1) we have eliminated all danger of a general anesthetic to the heart, lungs and kidneys; (2) we have cut no nerves, consequently the nerve functions remain unimpaired; (3) not a single vessel has been ligated, for none of sufficient size for ligation has been divided, and (4) there is no shock, no nausea and no straining.

Sodium Bicarbonate in Surgery.—Solutions of sodium bicarbonate have been much lauded for the bathing and dressing of wounds, and in the treatment of atonic ulcers, especially the varicose. C. LEVASSORT (Jour. de Méd. de Paris, May 10, 1903) has had recourse to the drug in powdered form, dusting it abundantly into the wounds, ulcers, etc., and then tamponing with sterilized gauze. He allows the gauze to remain in cavities so treated from fifteen to twenty days; simply withdrawing and cutting off a portion of the dressing every two or three days as the cavity fills in with granulations from the bottom and sides. When the remains of the first dressing are removed, the author states, the work of repair is found to be well advanced; healthy granulations having formed and reduced materially the depth of the wound. A second dusting with sodium bicarbonate and dressing with sterilized gauze is said to complete the cure. Levassort has used this method of treatment for the past five years; and, in his experience, healing proceeds more rapidly with this method than with any other. The application of the soda is followed by some discomfort—burning and itching—but this is said to subside within fifteen to twenty minutes.

OBSTETRICS AND GYNECOLOGY.

Obstetrical Paralysis.—In the infant the earlier writers appear to have assumed that this injury was due to direct pressure on the nerves, says WILLIAM THORBURN (Brit. Jour. of Obstet., May, 1903). Pressure on the neck, however, is incompetent to injure the lower roots of the plexus, while pressure in the axilla would not select for injury the fifth and sixth roots only. The appearance of Erb-Duchenne paralysis at the time of birth is not very common; statistics quoted by Duval and Gullain showing that it may be expected about once in 2,000 births, and that in the vast majority of cases delivery has required some operative interference, while nearly one-half have been breech presentations. Lateral stretching will obviously bear most heavily upon the upper cords of the plexus, and will thus explain the selection for injury of its fifth and sixth

roots. This brings the causation of obstetrical paralysis of the Erb-Duchenne type into line with that of ruptures of the entire plexus and allows the assignation of all cases to direct traction, the only difference being that in the former the plexus is stretched by deflection of the head, whereas in the latter the impact is more commonly received upon the shoulder. The prognosis of injuries of the brachial plexus, whether obstetrical or otherwise, is unsatisfactory and Bruns has recently shown that of all cases of partial injury, only 26 per cent. recover, whereas 66 per cent. of similar injuries to single nerves below the plexus undergo spontaneous cure. The treatment of obstetrical paralysis has, until recently, consisted solely in the use of warmth, massage, galvanism, and the like. In cases of the Erb-Duchenne type arthrodesis at the elbow may be of service, but though this measure was suggested in 1886 it is not known that it has been actually carried out by anyone. Of primary suture of the plexus and its root there are numerous cases. Kennedy has now extended the operation to obstetrical paralysis, and reports three cases in all of which the cicatrix was situated at the junction of the fifth and sixth cervical nerves. The first operation was performed two months after birth, the second fourteen years after, and the third six months after, and suggests two months as a reasonable period to wait for spontaneous recovery. The result was excellent, but the operations had been of too recent a date to judge what the final outcome of the cases might be. On the evidence before us it may be safely assumed: (1) That in the vast majority of cases of obstetrical paralysis the cicatrix will be found in accessible places at the junction of the fifth and sixth roots; (2) that recovery without operation is highly doubtful, and is certainly not to be expected unless marked improvement occurs within the first two or three months; (3) that if marked improvement does not occur within this period the plexuses should be exposed; (4) that perineural cicatrices should be removed and the nerves resected unless they are free from internal callus; and (5) the results of such operations are likely to be favorable.

Double Pregnancy in a Double Uterus.—A case of this variety in a woman, thirty-four years old, who had had three previous normal labors, is reported by J. B. HELLIER (Brit. Jour. of Obstet., May, 1903). She ceased to menstruate in the middle of May, 1902. During pregnancy the uterus was unusually large and there was a great deal of abdominal pain and edema of the feet. Labor began January 28, in the forenoon, and a living child was born at 5.30 P.M., the head presenting. The placenta followed. On abdominal palpation the presence of a second child was recognized, but the uterus showed but little tendency to expel it. At 11 P.M. the hand was introduced into the uterus and it was found to be empty. One hour later, on the second examination, a second os uteri was discovered above and in front of and somewhat to the left of the other, the uterus being rotated on its long axis, a fetal head was just within touch. The second child was delivered by podalic version, and the patient made an excellent recovery. A month later it was found that the uterus was bicornuate and that there was a complete septum reaching down to the cervix. After three pregnancies in one side or the other of the uterus, the two sides became pregnant simultaneously. When labor came on the head in the right descended and dilated the cervix, and in so doing prevented the descent of the other head. The fact that the left cervical canal lay anterior to the right is a phenomenon which has been noticed before. The change which involution produced in the cervix was also striking. The double canal and thick septum were so much in evidence after careful examination at the time of delivery, and yet a month later the septum was so much reduced within the os that the double nature of the uterus and the cervical canal might easily have been overlooked on simple, digital, vaginal examination.

The Effects of Vaporization.—A specimen, removed fourteen days after curettage and vaporization had been performed for irregular and frequent menstruation by G. F. BLACKER (Brit. Jour. of Obstet., May, 1903), illustrates very well the effects of superheated steam upon the mucous membrane and muscular tissue of the uterus. From the naked-eye appearance and the examination of the microscopic findings it was evident that not only the whole of the mucous membrane of the body of the uterus and the cervical canal had been destroyed by the action of the steam, but that a considerable part of the mucular tissue had also been destroyed in that part of the cavity of the uterus occupied by the intra-uterine canula. In order to avoid any risk of perforating the fundus of the uterus the end of the canula is not introduced up to the fundus of the uterus, and the large cavity present in the specimen extending of the point 1.8 cm. from the upper limit of the body of the uterus, no doubt represents the part of the uterus exposed to the cauterizing effects of the intra-uterine metal tube, and the extensive destruction of tissue is due not only to the action of the steam, but also to the heat of the tube. The specimen illustrates that by the use of superheated steam it is possible to produce complete necrosis of the uterine mucous membrane, and that where the action of the steam is continued for so long a period as ninety seconds, the destructive action of the heated metal tube must also be taken into consideration. By the use of this method, therefore, complete destruction of the uterine mucous membrane can be obtained almost with certainty. From the entire absence of the glandular or lining epithelium in the specimen, it is evident that no regeneration of a perfect mucous membrane could have taken place. The further examination of the specimen entirely fails to show any evidence of the presence of a carcinomatous growth. It is, however, possible that the destroyed tissues may have been the seat of early carcinomatous degeneration. In cases where the entire mucous membrane has been destroyed, its place is usually taken by a layer of connective tissue containing no glands and covered by a single layer of cubical epithelium.

On Uterine Action.—In an able and valuable work by a leading obstetrician of to-day, it is stated that "the principle not to deliver in the absence of uterine contractions is the first point in the prevention of postpartum hemorrhage. Do not pull away the placenta without waiting for uterine contraction." In traction with forceps, he says, "pull with the pains, leaving off pulling between the pains." To this principle so laid down, WM. STEPHENSON (Brit. Jour. of Obstet., May, 1903) takes exception for the following reasons: (1) There are no clinical data in its support; (2) it is not in accordance with the author's experience and that of others who, when necessity has arisen, have not hesitated to deliberately empty the uterus without waiting for pains, and without thereby inducing hemorrhage; and (3) the opinion is a logical deduction drawn from an erroneous idea of uterine action. First let us consider the behavior of the uterus during the operation of Cæsarian section. The operator does not wait for a pain, but as soon as the membranes are ruptured he must deftly remove the child, otherwise he would find himself hampered by the rapid closing of the walls, not from contraction, but retraction; the wall at once resiles when freed from the cause of expansion. Again, he does not wait for contraction before extracting the placenta, but peels it off trusting to retraction to restrain the

bleeding. Secondly, for various complications of pregnancy it has at times been deemed advisable to empty the uterus artificially without at first inducing labor. The cervix is dilated and the child removed without waiting for or even desiring uterine contractions. Does the uterine cavity remain undiminished though empty, and does hemorrhage occur more frequently than under other circumstances? Thirdly, take a case of excessive hydramnios, where the patient is suffering much pain, and from difficulty of breathing she cannot lie down. To afford relief one does not wait for labor to set in but ruptures the membranes without hesitation, and the uterus will steadily retract. Fourthly, in severe hemorrhage in the third stage with retained placenta, or post partum where the uterus has melted away from the grasp, and the fundus cannot be defined by the left hand externally, the author has invariably introduced the right hand to remove the retained placenta. Here one can observe the difference between the sudden closing in the cavity by contraction and the more gradual, often slow, but progressive, action of retraction. The latter is by far the most frequent result. With such evidence as the above study of the subject, can there be any doubt that, apart from contraction, the uterus possesses the power of reducing its volume and capacity when emptied of a part or the whole of its contents. Although Duncan said at the time that he wrote, "that retraction is not dependent is difficult to prove," now that we possess clearer views on this subject his other statement must be accepted as true that, "retraction is a separate and distinct function, that is, it may go on without contraction."

NEUROLOGY AND PSYCHIATRY.

Position of the Head in Cerebellar Disease.—In a current number of Brain DR. FREDERICK E. BATTEN discusses the diagnostic value of the above by attempting to answer three very important questions: (1) Is a definite attitude assumed in cerebellar disease? This is often met with, but is not necessarily present throughout the course of the disease. It is manifest in an approximation of the ear, on that side of the body opposite to the lesion in the cerebellum, to its adjacent shoulder, and in the direction of the face toward the affected side. (2) Is this attitude the same as that following upon an experimental lesion and is the symptom itself of diagnostic value? Only in certain particulars, the following conditions being contrary to those obtained on experimental lesion: Approximation of ear to shoulder on opposite side; reflexes absent on same side; no anesthesia nor analgesia; nystagmus to opposite side. The symptom is less important perhaps than incoordination or weakness viewed from a diagnostic standpoint. It should not be the basis of a positive diagnosis but is to be considered merely as auxiliary evidence. (3) Is this position assumed in intracranial tumor in the absence of gross lesion of the cerebellum? Yes, the symptom occurred in a case cited and was probably due to blocking of foramina around the fourth ventricle. Too much importance should not be attached to the position of the head alone, but more indicative symptoms, such as those already mentioned, must be carefully sought for.

Regeneration of Posterior Spinal Roots.—An experimental study for the purpose of determining whether posterior roots are capable of regeneration in their intramedullary portion, has been made by W. G. SPILLER and C. H. FRAZIER (Univ. Penn. Med. Bull., June, 1903). The advisability of the operation recommended by them for the relief of tic douloureux—the resection of the sensory root of the trigeminus—depends largely on the absence of regeneration of these posterior root fibers within the spinal cord, because if the posterior roots are incapable of regeneration, we may assume that the sensory root of the Gasserian ganglion likewise is incapable of regeneration. The experiments were carried out on dogs. A laminectomy of two or three vertebræ was sufficient to expose several pairs of roots. The posterior roots were transfixed at two points with needle and fine silk, a short distance apart, and divided between these points. By tying the suture the divided ends were brought into perfect apposition, and then the external wound was closed. Only one of the animals lived sufficiently long (10 months) for the purpose of drawing any conclusions. Examination showed that the intramedullary portions of the roots operated upon were entirely degenerated, and no young nerve fibers could be seen anywhere in the usual distribution of the posterior roots within the cord. Degeneration could not be seen by the Marchi method, because all signs of recent degeneration, as shown by this method, had disappeared on account of the long time the animal was allowed to live after the operation. Although the conditions were most favorable in this case, no regeneration whatever took place.

Neuroses from Prolapse of the Kidney.—The more common of the nervous symptoms accompanying kidney prolapse are, according to A. H. GOELET (Ann. of Gyn. and Ped., June, 1903), vertigo, syncope, palpitation of the heart, restlessness, insomnia, frequent micturition, hysteria and neurasthenia. How often these may be due directly to irritation of the solar plexus it is impossible to say. They are dependent somewhat on gastro-intestinal disturbances, which may themselves be due to irritation of the symphathetic or to direct traction by the kidney on the duodenum. With the kidney prolapse there is constantly associated pain in the kidney region, in the ovarian region, in back, thighs and even the head. Irritability of the bladder, most manifest during the day, may be purely neurotic. The constant suffering, or dragging sensation, or fatigue on slight exertion, together with the digestive disturbances, may lead to hysteria or to neurasthenia. Such patients are never relieved until the kidney is completely detached from the colon, and permanently fixed in its normal position. Albaran believes that the movable kidney is a cause of constant internal trauma, and thus acts on the nervous system. The author thinks operation better than mechanical appliances, because (1) temporary relief of the symptoms does not mean cure; (2) the pressure of a belt or corset provokes undesirable irritation and may induce nephritis; (3) the operation has no mortality, and the cure is permanent.

Influence of Alcoholic Liquors on Digestion.—At present there is apparently no consensus of opinion regarding the influence of alcoholic liquors on digestion, probably on account of the different results obtained by various methods of experimentation, and also from the disposition to rely on clinical experience rather than on laboratory results. R. F. CHASE (Phil. Med. Jour., June 6, 1903) has lately made some experiments to determine what influence whisky and beer, taken with meals, had on gastric digestion. These articles, and also tea or coffee, were given with an Ewald's test meal on an empty stomach on alternate mornings. Analysis showed that salivary digestion was slightly delayed by whisky, and somewhat accelerated by beer. Peptic digestion, both in the stomach and in the test tube, was noticeably delayed by whisky and in a more marked degree by beer, in the latter case quite out of proportion to the amount of alcohol contained in the beer. Thus it would seem that liquor taken with meals, exercises on the whole only a harmful influence, while in cases of gastric disease its use is not followed by any beneficial results. The tests made with tea and coffee showed

that in tne amounts ordinarily used, they do not retard either salivary or peptic digestion, but that salivary digestion is accelerated slightly by tea. The results also show that these fluids also act as mild stimulants to gastric secretion, the digestive power of the secretions is not augmented, but on the other hand is not impaired, as in the case of whisky. Admitting the generally harmful effects of large quantities of tea and coffee, the author believes that an undue prejudice has been excited against the use of these beverages by the results obtained from laboratory experiments.

PATHOLOGY.

The Influence of Formaldehyde on the Blood.—The recent use of formalin in septicemia lends a peculiar interest to the research conducted by C. C. GUTHRIE (Am. Jour. of Physiol., June 1, 1903), on the effect of this gas on the coagulation and other phenomena of the blood. He found that coagulation is retarded in blood drawn into solutions of this gas in proportion to the amount of formaldehyde present. In sufficient amount, the latter prevents coagulation indefinitely. The average amount of formaldehyde necessary for this purpose in various animals, is 1 to 185.5 parts of the blood. Amounts of formaldehyde too small to prevent coagulation, prevent the clot from advancing beyond a delicate, jelly-like stage, for a period proportionate to the amount of formaldehyde present. The onset of spontaneous laking (solution of hemoglobin in the plasma) at room temperature, is not markedly delayed by small quantities of formaldehyde, but, once begun, it proceeds much more slowly than in normal blood.

Infectivity of Scarlet Fever.—During recent years there has been considerable change in the attitude of medical officers of health in regard to the communicability of scarlet fever. There is considerable doubt expressed now about the highly infectious nature of the disease during the later desquamating stages. L. C. PARKES (Practitioner, April, 1903) notes the change of view which has occurred in England and attributes it to the following reasons: (1) Desquamation is not a manifestation of scarlet fever alone and although more complete in this disease, yet the more moderate peeling of measles and Rötheln has not been considered as being of specially infective character; (2) the similarity between scarlet fever and diphtheria seems to point to an infective organism for the former similar in character to that of the latter. In each disease the tonsils and soft palate are the parts usually affected first. The tonsillar and buccal mucus is the home of the diphtherial contagion and it would seem probable that the same secretion is ordinarily the habitat of the scarlet fever virus; (3) fever hospitals which have taken to discharging patients before desquamation has ceased have not shown any increase in the "return" cases. Since the bacteriology of scarlatina has not yet been settled it is, of course, impossible to be positive about the most dangerous stages of the disease and hence it would perhaps be unwise to relax any of the present rules in regard to quarantine. In spite of the increasing numbers of carefully isolated cases each year there seems to be no appreciable difference in the prevalence of the disease, and as the expense incurred by this long confinement is such an important item, the necessity of it may well be questioned. The mortality of the disease, however, is constantly decreasing and is now only one-eighth what it was forty years ago. That again is another reason why less rigid rules may soon be expedient.

Fruit Vessels, Mosquitoes and Yellow Fever.—A practical investigation of this subject has been made by E. SOUCHON (Jour. Am. Med. Assoc., June 13, 1903), for the purpose of explaining certain facts in connection with the *Stegomyia* as a carrier of infection. The scarcity of *Stegomyia fasciata* on fruit vessels from ports quarantined against yellow fever was shown by the fact that out of 208 mosquitoes captured on a number of vessels plying between New Orleans and Central America, only 2.5 per cent. were of that species. In houses, however, the number was 40 per cent. The females were largely in the majority. The vessels plying between New Orleans and Havana furnished 16 per cent. of *Stegomyia*. During the fifteen years from 1886 on, only five cases of yellow fever were brought by these vessels to New Orleans, and in only one instance could the infection be traced to the ship, all the others, contrary to regulations during the quarantine season, had communication with the shore. The impunity of intercourse with non-infected vessels is shown by the fact that laborers constantly entered the holds of these vessels while in port and before fumigation had taken place and yet from 1886 to 1895 not one case of yellow fever originated in New Orleans. It was also found that the *Stegomyia* on non-infected vessels are not infected, as evidenced by the free intercourse just noted, although yellow fever was epidemic in the ports of call during the period in question. It is improbable that *Stegomyia* on infected vessels become infected before reaching the quarantine station because the percentage is so small (2.5 per cent.), the females must become impregnated before they will bite, the males on board are a few in number, the females must bite the patient within the first three days and cannot infect a human being until twelve days thereafter, the mosquitoes do not breed in sea or bilge water, the bitten subject must be non-immune and the cases on record are all primary. In the case of New Orleans at least, it is impossible for any mosquito to carry yellow fever into the city, because fruit vessels are not more than six days in transit before reaching the quarantine station, where all the insects are destroyed by fumes before the twelve days have expired. The author also found that mosquitoes will not live without moisture or water for more than three to five days during the summer months, which proves that there is very little liability of their being transported in baggage.

Duration of Life of the Yellow Fever Mosquito.—The laboratory experiments conducted by JUAN GUITERAS (Rev. de Med. Tróp., April, 1903), to determine the duration of life in the *Stegomyia fasciata* are of special interest in view of the fact that that insect retains its infectivity throughout its life. He thus describes his work: Eighteen mosquitoes, which were hatched on August 1, 1902, were made to bite, on the fifth of that month, a patient suffering from a fatal form of yellow fever; and of this number, seven were killed for the purpose of studying their salivary glands and intestines. The remaining eleven died after a period of from five to one hundred and fifty-four days.

THERAPEUTICS.

The Action of Camphor on the Heart and Blood-vessels.—The use of camphor in conditions of collapse and heart-weakness, according to H. WINTERBERG (Pflüger's Archiv, Vol. 94, Nos. 9 and 10), was founded originally on an empirical basis. The experimental investigation of the action of this drug on the mammalian circulatory system would seem to dethrone camphor from its place among the valued cardiac stimulants. The author found that the chief action of camphor upon the blood-vessels consists in a dilatation of the same, particularly in the areas of the vessels drained by the jugular and femoral veins. The point of attack in the production of this dilatation is to be sought in the periphery. The direct exhibition of camphor in the blood-current produces a slight and transient stimulation of the vaso-

motor centers, expressing itself occasionally in a slight rise in blood-pressure, followed by a rapid fall. Sometimes there are noticed, after the administration of camphor, certain undulatory variations in the blood-pressure, occurring at irregular intervals. These are to be attributed probably to a reflex excitation of the vasomotor centers, following the increased irritability of the latter produced by camphor. There is no evidence of any favorable action of the drug upon the work of the heart, although there is no evidence of any damage to the heart from small and moderate doses. The cause of the diminished blood-pressure is to be found in the dilatation of the smaller arteries. The consequent acceleration of the flow of blood and the synchronous diminution of frictional resistance, tend to explain the absence of change and even the slight increase of pressure in the left ventricle. The above results show no favorable action on the heart and reveal but an inconstant excitation of the vasomotor centers. The somewhat regular periodic rises of blood-pressure appear only after doses too large for therapeutic uses. The author's researches contradict the results of clinical experience, yet he would not withhold from camphor any medicinal value for, irrespective of its power of stimulating the cerebrum and the respiratory center, manifesting itself in an acceleration and deepening of respiration, the vasodilating property of this drug, by regulating the distribution and circulation of blood, is all the more significant, inasmuch as all the vascular territories do not share equally in this dilatation. Particularly the vessels of the splanchnic area are not dilated by camphor. Whether its capacity to lower the bodily temperature, and whether the common experience that after the subcutaneous administration of camphor, a hardly perceptible pulse is again made easily palpable, are to be attributed to this arterial dilatation, can only be determined by clinical investigations along this line.

Two New Peroxides.—This interesting class of chemical compounds has of late years received a large amount of attention. In a recent communication N. FRAENKEL (Progres Médicale, 1903, No. 2) has contributed a study on two metallic peroxides made from zinc and magnesium. These have been termed dermogen and diogen. The indications for use of these two new compounds are similar to those of other peroxides with certain modifications because of the presence of the metallic ion. Dermogen is a faintly yellowish powder, light, tasteless, odorless and insoluble in water. It is used externally almost exclusively and sets free nascent oxygen in about 9 per cent. Biogen is a light, tasteless, odorless and insoluble powder and is used internally. 1 gm. 15 grs. of the magnesium peroxide in the stomach is capable of producing one-half gram of hydrogen dioxide. Biogen is decomposed by the gastric juices, and the hydrogen dioxide formed is broken up and free oxygen results. This acts as an antiseptic and oxidizer and is thought to penetrate the tissues passing in through to the stomach wall. Its therapeutic indications have not as yet been thoroughly studied, but it offers an interesting field for clinical observations,

A New Form of Focus Tube.—In a paper on the subject of a new form of focus tube, C. W. ALLEN (Jour. of Cut. Dis., April, 1903) says that the rays from the target in the focus tube now in use do not emanate in all directions with equal intensity, but follow the same rule as light waves from a flat illuminated surface, and are the strongest in a line at right angles to the surface, and steadily decrease at every increase of the angle of obliquity. In the case of illuminating rays, as is well known, the decrease is as the cosine of the angle, and in a direction corresponding with that of the plane of the illuminated surface, the light becomes nil. In the case of the X-rays it may be assumed that the rule would be the same if the rays came from a geometric point, but on account of the size of the area from which the rays emanate, there are some rays at the plane of the anode. The greatest intensity of the rays is, as in the case of light rays, in a direction perpendicular to the plane of the anode, and in a line passing through a point in the anode at which the cathode stream impinges. It is therefore very inconvenient in the tube of ordinary construction to utilize these rays on account of their direction being away from the center of the tube and in a direction toward the cathode. In the tube presented by the author, devised by Dr. Milton Franklin, the rays of greatest intensity pass from a tube in the direction corresponding with the center of the free side of the bulb, and the strength of the rays at any angle to the right or left of this center will be the same. In aiming the rays at any part, an exact indication of the direction of the most powerful rays may be obtained from the annex through which the target support is directed. The essential feature of the tube, and wherein it differs from the others is in the position of the target and the cathode. The annex through which the target enters is placed midway between the other two provided for the second anode and cathode, and the plate of the target placed at right angles to its stem, presents a plane at right angles to a line passing through the free boundary of the tube midway between the anode and cathode annexes. The cathode is inclined to its stem in an angle of about 30 degrees so that the cathode stream impinges upon the target at an angle of about 60 degrees.

Prophylactic Against Poisoning with Rhus.—A thorough investigation of the nature of the poison of rhus discloses the fact that it resides in a poisonous oil which is communicated by osmoris from the lactiferous ducts of the leaves and stems to small hairs which grow upon the vessels and which are easily broken off and carried by wind or direct contact to the skin. C. SCHWALBE (Med. Rec., May 30, 1903) says that the ordinary neutral soaps will not neutralize the toxicondric acid, especially as these little hairs are liable to lodge and remain in the openings of the sudoriferous glands. If the exposed skin is bathed frequently with a one-half-per-cent. solution of potassium carbonate the poison will be destroyed. A 1 to 1½-per-cent. solution of ammonium chloride is also highly recommended as a prophylactic and also as a curative remedy.

Calcium Chloride in Hemorrhage.—In numerous instances, this drug has yielded, in the hands of J. C. REEVE (Am. Gyn., April, 1903) most excellent results in the control of bleeding. As it is well known, it is relied upon by Mayo Robson and others as a valuable means of forestalling chronic hemorrhage in gall-bladder surgery. Yet the latest works on therapeutics make no mention of it, and it has received but scant mention by the profession at large. Certain writers have even disputed its efficacy. The writer reports a case of a woman who entered his wards with profuse hemorrhage. Circumstances prevented operation at the moment and calcium chloride was prescribed. Several hours later the resident physician summoned the writer in haste under the belief that she had sustained an inversion of the uterus. A firm, pear-shaped body was found to be protruding several inches from the vulva with blood still trickling over its surface. On examination the tumor was found to consist solely of concentric layers of coagulated blood, which had grown as a stalactite grows, by successive depositions. Since the coagulum had formed only after the exhibition of the calcium salt the experience may be taken as going to prove the efficacy of the chloride of calcium in raising the coagulability of the blood.

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SATURDAY, JULY 11, 1903.

WEIGHT AND MENSTRUATION.

MANY and varied theories have been evolved from the inner consciousness of supposedly observant gynecologists with regard to the nutritional changes incident to menstruation. A rather prominent physiologist and author of a text-book on physiology in England predicated a distinct connection between the moon and menstruation, since, according to a large number of statistics most women menstruated during the first quarter of the lunar month. What is needed in this matter is more careful observation to determine what are the nutritional factors and the effects on metabolism of menstruation in the human female. Dr. Belfield, of Chicago, in a recent number of the *Journal of the American Medical Association* (June 13, 1903), seems to have opened a new field of investigation in this matter. He has found that there is a distinct weight wave of menstruation, that is to say, shortly before menstruation there is a distinct gain in weight, followed by a still more rapid loss of weight immediately after the flow has ceased. This loss in weight is not at all proportionate to the amount of material lost as menstrual blood, which is, after all, only a trifle, seldom amounting to more than a few ounces in the normal woman.

Dr. Belfield has found that in winter especially from 2½ to 5 pounds, which may be from 1½ per cent. to 5 per cent. of the subject's usual weight, are gained during the four or five days immediately preceding the beginning of the menstrual flow. The climax of this gain is immediately followed by the rapid loss of a large part, perhaps half, of this increase in weight (often within eight to sixteen hours) and then a more gradual loss of the remainder, extending over several days. He has found further that the premenstrual gain in weight is due not to increased ingestion of food, but to the diminished excretion, especially of water. On the other hand, the rapid loss of weight following the crest of the wave, is due not to abstinence from food but to rapid excretion, especially of carbonic dioxide and water. In one case Dr. Belfield observed a loss of 2½ pounds in weight during the five hours following the appearance of the menstrual flow, though neither urine nor feces had been voided during that period, and though the subject had had no exercise other than that incidental to clerical office-work indoors.

These observations of Dr. Belfield's are confirmed by the fact often noticed by women that apparently their flesh feels firmer just before a menstrual period begins and that this may be the preliminary warning that the flow is about to commence when they have forgotten the exact date at which menstruation should occur.

Nearly every gynecologist must be familiar with this story, though it has usually been put aside as of no special significance, or as being one of these vain imaginings that women are so apt to have about this time. As might be expected under the circumstances, the temperature curve during these rather marked changes in metabolism is not constant. There is usually a rise of about 1° F. during the days in which the increase of weight is most noticeable and a sudden fall after the crest of the weight wave is passed. It is probable that there is a more than corresponding variation in the pulse since the rapidity of the heart action is even more dependent on general metabolism than is the temperature range.

These observations are of the direct objective character that mean a distinct gain in knowledge. Much remains to be done to supplement them in order to understand the metabolic principle on which they occur. It is not improbable that the mystery of the influence of the ovary on nutrition and of the question of an internal secretion from this organ, as seems almost surely to be the case, from many recent observations, may be solved by

the continuance of this investigation. The data are rather easy to obtain and there is opportunity for physicians in different parts of the country to tell us how much temperature and climatic changes of various kinds may influence metabolism in association with these menstrual alterations of weight and general condition. In a word, an attractive subject for investigation is here presented, upon which it is to be hoped many observers will find opportunities for research.

"BERRIES AND CREAM."

THE bray of the ass once more breaks the stillness of the air. An editorial in the New York *Times* of June 10, with the above heading, sarcastically points to the work of the German Consular office in estimating the number of bacteria contained upon the various fruit products that are consumed at this season of the year, with contemptuous ignorance and derision. Aspersion is cast at the counting of germs in milk and cream, and it is inquired, "What can be the popular value of this sort of information?"

Our esteemed contemporary has evidently lost track of the well-known happy results that have come from just such research work. What brought about the establishment of the now recognized indispensable Straus milk stations? It was nothing more or less than the painstaking investigation of the germ infection of the fresh milk and cream "just from the cow" that determined these to be the cause of the yearly death-dealing, devastating plague that each summer had carried off the children of the rich and the poor alike.

What induced John D. Rockefeller to donate millions of dollars toward the establishment of an institution for medical research of this kind?

It has been this selfsame sneering ignorance that has for centuries prevented the onward progress of science in all its branches, and it is painful to see it in the columns of one of the ablest of our New York dailies.

It is a well-known fact, even to the laity, that the spread of disease by means of infected fruits may readily take place. Epidemics of cholera and yellow fever have had their origin in the introduction of certain fruit products both in this and other countries. In Japan it is impossible to eat raw vegetables because of the liability of infection with the ova of certain animal parasites of many varieties, chief of which is the most annoying tapeworm. The Italian fruit vender, the purveyor of the city's fruit supply, polishes his wares by expectorating upon them and then gives to them a beautiful luster by means of a dirty rag pregnant with syphilis or what not. The farmer deposits his feces in the brook running through his ten-acre lot and the eggs of the harmless tapeworm and other parasites find a resting place upon the leaves of the favorite watercress, soon to make its way to our tables and thence to our alimentary tracts. The knowledge of these valuable facts were obtained in no other way than those which the New York *Times* would make the butt of an inane and senseless joke.

It is only too unfortunate that it is a difficult task to impress upon the minds of the laity the importance of preventive medicine. One is reminded of the story of the ignorant Irishman, who, when during an epidemic of typhoid fever, was told that it was best to boil his drinking water in order to escape infection, and by so doing the germs which caused the disease would be killed, remarked "that he would just as lave make an aquarium out of his stomach as to use it as a morgue."

The editorial ends with the sage remark that "Man cannot evade microbes, however he may try." Surely the *Times* has not forgotten that the eradication of the various cholera and other epidemics that carried away so many of our forefathers was brought about by the discovery of the presence of germs on various sorts of articles brought to our shores from other lands. The *Times* would be one of the first to raise a hue and cry if the quarantine officers were to permit to pass through them a shipload of oranges coming from a port known to be infected with some contagious disease.

DISEASES OF HOT CLIMATES.

OUR comparatively recent acquisition of territory in the American and Eastern tropics gives us a renewed interest in the diseases that affect especially tropical regions. The English establishment of schools of tropical medicine is an index of the practical interest which this generation realizes must be taken in the special diseases of different and distant countries if sanitary measures are to make living in colonial regions any more wholesome than it has been in the past. There has come in recent years moreover the precious realization that the comparative study of the diseases of the different parts of the world may very well serve to throw light upon even the best known diseases in the ordinary conditions of the temperate zone. Besides, with the increase of commercial activity

at the beginning of the twentieth century quarantine is ever of more vital interest and tropical diseases are found not to be absolutely limited to very warm climates but occur sometimes under rather alarming circumstances in the temperate zones.

In recent years many of our large cities have had cases of the so-called sleeping sickness in their hospitals. This has sometimes been considered an affection limited to the negro race. It is evident, however, that symptomatic conditions resembling the so-called sleeping sickness of Africa may occur among other races and without the predisposing influence of a torrid climate. In his recent book on diseases of warm countries, Dr. Scheube, late professor of medicine and pathology at the medical school of Kioto, Japan, reviewing the literature of sleeping sickness, declares that in the few autopsies recorded the pathological condition has usually been a meningo-encephalitis. He adds that Mauthner suggests a relationship between sleeping sickness and Wernicke's acute polio-encephalitis superior.

Almost needless to say, bacteria have been found in some of these cases and have been declared specific by certain observers. In Africa, the disease seems to be limited to negroes. This is sometimes attributed to the fact that the lethargic condition which develops is only a small exaggeration of the ordinary condition of the negro in South Africa whenever he is asked to be quiet for a time. Missionaries tell that it is practically impossible to keep the South African negro awake for sermons and instructions and their only hope is to use the Socratic method and keep asking frequent questions. Portuguese observers have found a short bacillus which they declare to be the cause of the disease, but so far their discovery has not been confirmed by others. Manson believes that the condition is usually due to the presence of the *Filaria perstans*, a small blood, worm-like parasite that has been found in some of the cases in North Africa, especially along the Nile, though it does not seem to occur in the southern part. It is possible that some of these suggestions may be useful in leading American observers to the more careful investigation of some of the cases of continuous lethargy that are reported from time to time in this country.

With regard to the interesting oriental conditions known as running amok, or amuck, during which the subject of an attack usually runs wildly through the street brandishing firearm or saber and killing every one whom he can reach, the present generally accepted theory is much more satisfactory than some of those formerly suggested. The condition used to be attributed to the inordinate consumption of certain crazing drugs. There is no drug known in the East, however, that produces any such excitant effect. The condition is now recognized as a temporary mania on an epileptic basis and in a number of recent cases scars have been shown on the tongue demonstrating the occurrence of previous attacks of epilepsy. The condition then is only one of these epileptic states with homicidal tendencies which are noted in other countries and which are making the path of the medicolegal expert and the proper enforcement of laws with regard to murder when committed by epileptic patients ever more and more difficult.

The distribution of the ordinary infectious diseases in the tropics is extremely interesting. Whooping-cough, apt to be considered with us rather a disease of cold weather, early spring and late fall, is very frequent and very fatal among the South Sea Islanders. In 1883 3,000 Fijians were carried off by an epidemic of this disease that we are apt to call one of the ordinary children's diseases. The distribution of epidemic parotitis, mumps, and acute muscular rheumatism is exactly the same and they are rather rare diseases in the tropics. There is no acute rheumatic arthritis in Manila or Singapore. This is an interesting commentary perhaps on the bacillary origin of rheumatism and hints at the probable absence of the microbe of the disease as yet in these parts.

Smallpox becomes a veritable scourge in the tropics and, curiously enough, the protection afforded by vaccination is not near so long-lasting in warm climates as in temperate regions. This shows the need for warning those about to go to warm countries of the advisability of having their vaccination renewed. There has been a general impression growing of late years that vaccination can not be depended on to protect for as many years as used to be thought, when the epidemics of the disease are as virulent as those which usually occur in the tropics. Measles is very common and more fatal than in the temperate zones, showing that the so-called catching of cold or exposure to low temperature is not as serious a cause of fatal complication in measles as is sometimes thought. Scarlet fever is not endemic in the tropics at all. When cases of the disease are introduced from without it does not spread and, at most, affects only those who have been in intimate contact with the patient. The scarlet fever itself

soon dies out. This is a very curious and rather surprising observation and may lead to the finding of some reason for the anomaly due to some characteristic of the microbic cause of the disease which has not as yet been definitely recognized. It may also serve as a criterion of any announced bacterial causes of the disease somewhat as exposure to cold was used with regard to bacteria found in yellow fever cases. It will be remembered that Professor Vaughan, of Ann Arbor, used this test for the effective rejection of Sanarelli's supposed bacillus of yellow fever.

ECHOES AND NEWS.

NEW YORK.

Babies en Voyage.—The first trip for the season of St. John's Guild Floating Hospital took place last week. The boat left the foot of West Fiftieth street with 338 people on board, including 78 babies. The boat then made stops at West Thirty-fifth street and West Tenth street, where 600 more passengers were taken on board. The boat proceeded down the bay and off New Dorp landed the children who were very ill, at the Seaside Hospital of the Guild. The Guild will operate only one boat this year, owing to lack of sufficient funds. John P. Faure, former Commissioner of Charities, who is in charge of the trips, said that more funds were needed for the work. Since last year the boat has been fitted with wards for dispensary service, and there is also a quarantine for contagious diseases on the upper deck.

Program of the Summer School in Philanthropic Work.—The sixth annual session, commencing June 22 and extending to July 31, 1903, is now in progress, being conducted by the Charity Organization Society of the City of New York, of which Philip W. Ayres is director. Dr. Silas F. Hallock, of New York, will be in charge of the meetings devoted to medical charities, for which four days will be allowed, as follows: Thursday, July 16—The management of contagious diseases in New York. Dr. William Hallock Park of the New York Municipal Laboratory; Friday, July 17—What the Charity Worker Should Know of the Treatment and Prevention of Tuberculosis. S. A. Knopf, M.D., New York; Saturday, July 18—Social Factors in the Prevalence of Consumption. Miss Lilian Brandt, statistician of the Committee on the Prevention of Tuberculosis, Charity Organization Society; Monday, July 20—The Problem of Caring for Children in Institutions. Mr. R. R. Reeder, superintendent of the New York Orphan Asylum. This subject naturally falls in the preceding section, but it is treated at this time because Mr. Reeder cannot be present on the earlier date; Tuesday, July 21—If the conditions permit, Dr. Alvah Doty, health officer of the Port of New York, will take the members of the school to visit the quarantine station and explain its work.

A New Hospital Opened.—Commissioner Folks of the Department of Public Charities announces that he has opened on Blackwell's Island a new hospital for convalescent patients under the jurisdiction of his department. "The object of the Hospital for Convalescents," he says, "is to aid patients in their quick recovery. It is the purpose to admit patients who can be brought back to a useful life by a few weeks of rest with healthful surroundings, good treatment, and nourishing food. Chronic, contagious, and incurable diseases will not be received. Patients will ordinarily be allowed to remain for a period not exceeding three weeks, but special cases may remain six weeks if approved by the resident chief of staff. Heretofore, there has been no public institution of this kind in New York city, and the result has been that frequently patients, after an acute disease or surgical operation, were forced to leave the city hospitals, to provide room for emergency cases, in a state that often produced great injury to themselves. The need for such a hospital has been strongly urged by charitable societies and philanthropists for some years. The hospital is in the building formerly occupied by the Manhattan State Hospital, now the property of the Metropolitan Hospital on Blackwell's Island. It has been altered and repaired at a cost of $17,500, to fit it for its present use. It is situated on the northern end of Blackwell's Island, facing the grounds of the Metropolitan Hospital on one side and the East River on its rear. The present capacity is 40 beds for men and 30 for women. It will be increased as needed to about 70 beds for men and 60 for women."

PHILADELPHIA.

Dr. Gibbon on Pennsylvania Hospital Staff.—The vacancy on the surgical staff of the Pennsylvania Hospital caused by the death of Dr. Thomas G. Morton has been filled by the appointment of Dr. John H. Gibbon. The appointment was made from among a dozen of surgeons applying for the position. Dr. Gibbon was last year elected professor of surgery at the Philadelphia Polyclinic.

Change in the Board of Health.—The places of two of the lay members of the Board of Health have been filled, as their terms expired, by the appointment of Dr. Charles B. Penrose and Dr. Leonard Pearson. Dr. Penrose was formerly a professor at the University of Pennsylvania and Dr. Pearson is at the head of the Veterinary Department of that institution. The appointments are in line with other actions of Director Martin who is surrounding himself with advisors and assistants who are especially adapted to fill their positions.

Dr. Pearce Goes to Albany.—Dr. R. M. Pearce, Assistant in the Pathological Department of the University of Pennsylvania, has been elected Professor of Pathology in the Albany Medical College and Director of the Bender Institute of Pathology, Albany, N. Y. Dr. Pearce will have as assistants Dr. E. M. Stanton of New York and Dr. Charles K. Winne of Mount Wilson, Md.

Paid Medical Inspectors a Possibility.—Representatives of the Public Education Association have petitioned Director Martin for a corps of paid medical inspectors of public schools. Dr. Martin is in thorough accord with the plan, and is in favor of an appropriation of $100,000 for the employment of 130 inspectors at a salary of $75 for each school month of the year. The volunteer force from January to September of last year discovered 3,446 cases of contagious diseases and 2,430 cases of non-contagious diseases among the school children of the city, but it is believed that much better work would be done under a system of paid inspection.

Dentists Sentenced for Conspiracy.—George C. Courtright, President of the Alba Dental Company, has been sentenced to one year and Dr. William Powell, manager, to three months' imprisonment,

because of conspiracy to defraud. A dental student employed by the firm, broke the jaw of a person applying for treatment, and suit was brought against the company for employing unregistered assistants. Courtright, although not a graduate of any dental college, admitted that he was called "Doctor" by his employes and had the professional title printed on his cards. It is said that several prominent dentists and the faculties of local dental colleges were also interested in the prosecution.

Hospital Plans Halted.—Work on the proposed buildings for the indigent and the insane of Philadelphia has been ordered suspended. If Councils approve the plans of the new Director, larger sites, distinct from each other, will be sought probably in Bucks and Montgomery counties. As planned at first the buildings have together only 100 acres. The projected buildings will have from 600 to 1,000 acres each as grounds and the buildings will be planned so that they may be added to from time to time. The new plans have in view the outdoor recreation and employment of the inmates of the institution.

Pennsylvania University Selects Dr. A. J. Smith for Professor of Pathology.—The Trustees of the University of Pennsylvania, at their meeting last Wednesday, unanimously chose Dr. Allen J. Smith, of the University of Texas, to be professor of pathology to fill the vacancy caused by the resignation of Prof. Simon D. Flexner, who goes to the Rockefeller Institute for the study of bacteriology in New York. Dr. Smith is professor of pathology in the Medical Department of the Texas University and is also Dean of the Medical Department.

Preparatory Course for Nurses.—At the solicitation of Dr. S. Weir Mitchell and the superintendents of the leading nurses' training schools in Philadelphia, the Drexel Institute has undertaken to organize a Preparatory Course of Instruction for Nurses, under most competent instructors. Fee is $30 per term, there being two terms in the year, beginning respectively, September, 1903, and February, 1904.

CHICAGO.

Enforce the New Milk Ordinance.—The passage of the new milk ordinance, which embodies stringent regulations for insuring pure milk for Chicago, marks an important extension of the health bureau's authority over the milk supply. The Health Department has been greatly hampered by lack of funds and uncertain milk supply. The inspection has been inadequate, and much impure and adulterated milk has been marketed in the city. The greatest imposition upon the poor was the sale of "skimmed milk" as whole milk, a traffic that yielded large profits to dealers. Tempted by the lower prices, the poor purchased it in ignorance of the fact that it was not only absolutely lacking in nourishment, but that it gradually starved babies fed upon it into disease. As milk is the staple article of food for the young as well as for many classes of invalids, its purity is a matter vitally related to the public health.

Nathan Straus Pasteurizing Plant.—Nathan Straus arrived in Chicago a few days ago to supervise the work of installing the Pasteurizing plant which he has donated to the Children's Hospital Society of Chicago. Work on the plant is progressing so rapidly that the distribution of milk probably will be begun within a week. Fifteen branch stations will be established, and many thousands of families will be supplied from them. Circulars have been sent out explaining the enterprise, and the milk commission of the society is seeking contributions of $5,000 to carry on the work.

Nurses Graduate.—Eighteen nurses graduated from Mercy Hospital Training School June 30. Professor N. S. Davis, Jr., addressed the graduating class.

Reopening of Lincoln Park Sanitarium for Sick Babies.—This Sanitarium has just begun its seventeenth successive season. During the fifty-nine days in which the Sanitarium was open in 1902, more than 35,300 children and 45,440 visitors were received at the institution. Of the children, 7,249 were sick babies, attended by mothers, who in many cases were quite as ill and helpless as the little ones. Persistent course treatment was administered to 1,690 sick children.

Mortality Statistics.—Notwithstanding the favorable showing of general mortality, the deaths from contagious diseases of childhood—notably diphtheria—remain distressingly high. The steadily increasing mortality of diphtheria is nothing short of a reproach to the medical profession. The value of antitoxin, both as a curative and as a preventive, has been demonstrated as no other medicinal agent ever has. And yet within the week the death is reported of the wife of a physician after but a few days' illness of diphtheria. The doctor himself was also stricken. Antitoxin, in full strength and quantity, never yet failed to cure a case of diphtheria when administered on the first day of the disease, and but rarely when on the second or third days. Just as certainly, when administered within even three days after exposure to a case, it will prevent contracting the deadly disease. In every case of suspicious sore throat, antitoxin should be given at once and in large amount. It can do no possible harm if the disease should prove not to be diphtheria; it will save life in 99 cases out of a hundred, if it be diphtheria.

GENERAL.

Alcoholism in Belgium.—Recent investigations show that there is one liquor saloon to every 36 inhabitants in Belgium; this proportion outnumbering that of France where it is one to 75 inhabitants, England 1 to 82, Prussia 1 to 100, Austria 1 to 200 and Russia 1 to 991.

The Fifth International Congress of Dermatology.—This Congress will be held in Berlin September 13 to 17, 1904. Subjects for discussion will be: (1) Syphilitic Affections of the Circulatory System. (2) Cutaneous Affections and Their Relation to Disorders of Nutrition. (3) Epithelioma and Its Treatment.

The Special Senses of Animals.—Dr. Werner, of Vienna, has lately printed the results of his observations upon the special senses of animals, especially upon the senses of reptiles and amphibians. He concludes that these latter are capable of going directly toward water, which attracts them, so to say, even at long distances. Light acts upon them, independently of heat. In winter they quit warm lairs to go to sunlight. Their sight is generally good and is probably their most acute sense; yet their vision is very limited. Crocodiles cannot distinguish a man at distances above ten times their length. Fish see for only short distances. The vision of serpents is poor. The boa-constrictor, for example, can see no further than a third of its own length. Some snakes see no further than one-eighth of their length. Frogs are better endowed and see twenty times their length. The hearing of all these animals is even worse than their sight. Most rep-

tiles are deaf, especially boa-constrictors. "Deaf as an adder" may represent a careful observation of our ancestors.

Tuberculosis Sanatorium.—Dr. F. M. Pottenger is building a sanatorium for tuberculous patients at Monrovia, California, sixteen miles east of Los Angeles at the foot of the Sierra Madre mountains. The site of the sanatorium is on an elevation above the town at an altitude of about one thousand feet. All of the rooms will face south, and from them can be obtained a view of the San Gabriel Valley for nearly fifty miles with Catalina Island, sixty miles away, plainly visible on clear days. The capacity of the institution will be about fifty patients, only the administration building, with a few rooms, will be built this summer.

Regulation Affecting Post-Office Physicians.—Postmaster-General Payne on July 1 issued an order abolishing the position of physician in post offices at the close of business June 30, 1903. This order wipes out a small list of officials whose employment without specific authority of law has caused wide discussion in connection with the Post Office investigation. Some of these offices paid $1,700 a year. The post offices employing physicians up to the close of the fiscal year, when the Postmaster General's order took effect, are New York, Chicago, Brooklyn, Philadelphia, and Boston.

Obituary.—Dr. Charles Lancaster, ninety-five years old, a well-known physician, lawyer and literary man, died last week in Plainfield, N. J. He was born in East Winthrop, Me., and early in life was intimately acquainted with Emerson and Longfellow. He was a talented writer, and entered the medical profession and practised for many years. He was the author of many newspaper and magazine articles and wrote several text-books. He lived at one time in Philadelphia and came to Plainfield in 1895.

CORRESPONDENCE.

OUR LONDON LETTER.

(From Our Special Correspondent.)

LONDON, June 27.

BIRTHDAY HONORS—THE ROYAL FAMILY AND THE MEDICAL PROFESSION—RETIREMENT OF SIR FREDERICK TREVES.

THE list of "Birthday Honors," as they are called, which was published yesterday contains the names of several members of the medical profession. By far the most distinguished of them is Dr. Manson, whose name is so closely and so honorably associated with the establishment of the mosquito theory of malaria. He is now "Sir Patrick" and his wife is transfigured into Lady Manson. Manson has not only been a pioneer in research, but he has been the initiator of the movement in this country for the special study of tropical diseases. The London School of Tropical Medicine is his creation. He is Medical Adviser to the Colonial Office, and he has used the opportunities afforded by his position to impress on Mr. Chamberlain the vast importance, from the point of view of the expansion of the Empire, of finding means to protect colonists against tropical diseases. This is frankly acknowledged by Mr. Chamberlain himself in a parliamentary paper recently issued, in which the work done by the Schools of London and Liverpool and by scientific expeditions sent out to West Africa, the West Indies and elsewhere, is set forth in detail. Manson's work entitles him to the gratitude of the human race, but he would have had long to wait for recognition had he not held an important office under a statesman whose influence is paramount.

Another physician who exchanges the title of "Dr." for that of "Sir" is Stephen Mackenzie, a younger brother of Sir Morell Mackenzie, whose attendance on the Emperor Frederick has made him a historic character. Sir Stephen Mackenzie is an excellent all-round physician who has never stooped to court the favor of the public by any kind of advertisement. The unpopularity of his brother, to whom he was under great obligations, made his path particularly arduous, but he conquered by sheer straightforwardness. He is the senior physician to the London Hospital, an institution which has of late basked in the sunshine of royal favor. This is partly due to the interest taken by the Queen in the light treatment introduced by her countryman, Finsen. The London Hospital was the first in this country to make provision for the application of this method, and the Queen presented it with some lamps for the purpose. Adroit use has been made of this act of royal beneficence by the Chairman of Governors, Mr. Sydney Holland, himself the grandson of a well-known physician, Sir Henry Holland, who married the daughter of Sydney Smith; and the London Hospital is reaping the reward of clever appeals to the instinct which is strongest in the British breast—that of loyalty.

Knighthoods are also conferred on Mr. A. D. Fripp, who found fame and fortune in a wound made on the person of a princeling by a poisoned shaft from Cupid's bow; on Dr. Perry of Guy's Hospital, who is the leading spirit on the Advisory Board of the Army Medical Service; and on Dr. P. Heron Watson, Surgeon to the King in Scotland. A number of decorations also fall to the share of senior medical officers of the Army. There is no name of any special distinction among them; they are like *fortisque Gyas fortisque Cloanthus* among the followers of Æneas.

The King, who is an Honorary Fellow of the College of Physicians and Surgeons, is fairly orthodox in his medical belief. Even before his attack of appendicitis he took an interest in that important department of surgery which takes not the vermiform, but another appendix, for its province. At any rate he has been known to criticize with severity the treatment adopted by eminent surgeons of certain disorders which, *consule Planco*, were rather common among the noble lords who deemed it a privilege to be his lackeys. But in medicine the Queen has a distinct leaning to heretical doctrines. Some time ago when a few homeopaths were getting up a memorial to one of the number, Mrs. Clarke, the wife of Dr. John H. Clarke, editor of *The Homeopathic World*, asked for a subscription from Her Most Gracious Majesty, on the ground that "Mrs. Clarke believes that Her Majesty has taken an interest in homeopathic practice and trusts that the foundation of the British Homeopathic Association, under the presidency of Earl Cawdor, for establishing a School of Homeopathy, so much needed in London, will meet with Her Majesty's sympathy." Whether it did so or not, I am unable to say. The Queen's name does not figure in the subscription list, but an awkward situation would be produced if the Queen went out of her way to express publicly her sympathy with an unimportant sect. The position is somewhat akin to that of Lord Chancellor Thurlow when he was asked by some Noncomformist divines to remove the disabilities under which they then labored. He replied, "Gentlemen, I can do nothing for you. The Church of England is established by law in this country. You get your d—d religion established and I will do anything you like." Orthodox medicine is "established" in this country and medical noncomformity cannot, therefore, be openly recognized by royalty. As an illustration of their position I may mention that

it is perfectly well known that they one and all cordially detest vivisection, but they do not dare to say so.

In connection with the relations of the royal family to medicine and its professors, I may take this opportunity of pointing out that a story told in your columns, in the issue of March 28, about Sir Richard Douglas Powell, is quite a curiosity of inaccuracy. That eminent physician who is said to be "well known for his bluntness" is represented as speaking with remarkable plainness to the King and as replying to the remonstrances of Sir Francis Laking with a declaration that if there was to be any "squirming" Laking must do it. Laking is indeed a first class "squirmer" and is known among his friends as the "Medical diplomat." But Douglas Powell is the very opposite of blunt; he has the bland unctuousness of manner as he has the solemn appearance of an ecclesiastical dignitary. He takes himself and everything that he does very seriously indeed. He talks like Sir Oracle, whom no dog's bark should be suffered to interrupt. The stories related of him by your contributor would fit the late Sir William Jenner who, though trusted by Queen Victoria, was disliked by the present King for his plainness of speech. But Sir Richard Douglas Powell would think it blasphemy to be accused of the language put into his mouth.

Sir Frederick Treves has just intimated his intention of retiring from practice at the end of July, that is, at the end of the London season. He is a man in the prime of life and in full vigor of mind and body; he is also at the highest point of what economists would call his productiveness. His determination has therefore caused no little surprise among his professional brethren, though I have no doubt it will be highly approved by those of them who make a speciality of abdominal surgery. I do not know what may be the true inwardness of the retirement of the most successful surgeon in Great Britain at the very height of his popularity. It is not ill-health, for he means to continue his work as a member of the Advisory Board of the Army Medical Service. It is probably a natural desire for rest after twenty-five years of exceptionally exacting work. Few men have worked harder than Treves. Last week he performed ten abdominal sections, and I have been told by one who knows him well that since the operation on the King he has been so overwhelmed by the crowd of patients that there have been days when, if he had had the time, he might have done fifteen operations between sunrise and sundown. He has, of course, made a considerable "pile," and he has no family now depending on him, one of his daughters having died soon after his return from South Africa, while the other was married within a week or two of the historic operation at Buckingham Palace. It has been said that he has an ambition to win fresh distinction in political life, but this he positively denies. It is tolerably certain, however, that he will be heard of again. His retirement may turn out to be like that of Gladstone who, after playing Cincinnatus for a few years, came from his cabbage garden to take the head of his party. It is at any rate to be hoped that Treves will, for the benefit of science and mankind, gather the fruits of his unrivaled experience into permanent shape.

The Bactericidal Action of Human Blood-Serum.—Experiments conducted with the blood serum of healthy human subjects have been made by E. LOWENSTEIN (Deut. Archiv f. klin. Med., Vol. 76, Nos. 1-3), in order to determine not only the actual bactericidal properties, but also whether there is any relation between this property and the course and severity of the disease. It was found that the serum of adults possesses strong bactericidal action when directed against typhoid bacilli and cholera vibrios, but only a weak action against anthrax.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON GENITO-URINARY SURGERY.

Stated Meeting, held April 15, 1903.

John Van der Poel, M.D., Chairman.

Gumma of the Lip.—Dr. James Pedersen gave the history of a man, twenty-three years old, a cook by occupation, who was admitted to the hospital with an extensive ulceration involving the left half of the upper lip, extending into the mouth at the angle for some distance, and having a copious, fetid, purulent discharge.

Fig. 1.

Appearance on admission to the hospital.

It was a very unsightly condition. The absence of induration and of inflammatory thickening was marked. He was first admitted to Dr. Bryant's service with a tentative diagnosis of epithelioma; but was transferred to Dr. Bang's service and came under Dr. Pedersen's care. A history of an initial lesion eight months before was obtained. He was at once placed under antisyphilitic treatment. Later he was presented before two clinical societies; the diagnosis of epithelioma was made by some notwithstanding that the condition had

Fig. 2.

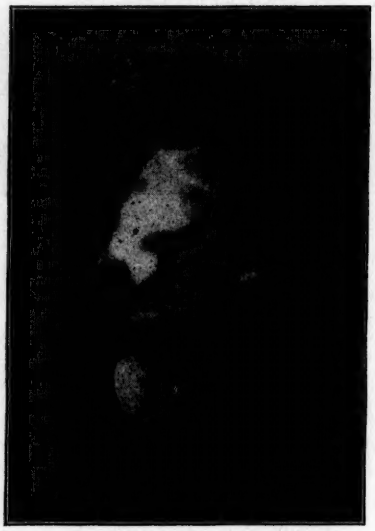
Gumma of the lip; after about two weeks of treatment.

improved under mercury and iodide of potash. Tuberculosis was easily excluded. Treatment by hypodermatic injections of mercury and increasing doses of iodide of potash had been followed by good results, improvement continuing progressively. When the patient left the hospital there remained only a small unhealed surface. The patient reported at his office once or twice after that. Dr. Pedersen thought it interesting to note that, in spite of the large ulcerating surface originally,

the resulting scar was not very perceptible and the deformity but trifling.

Cyst of the Sheath of the Penis.—Dr. James Pedersen related the history of a man who was admitted to the hospital in November, 1902, with the following history: He had had no venereal disease. About eight months before admission he had been struck on the left side of the penis by a baseball. The spot became painful but no swelling occurred until two months after the receipt of the blow; this swelling was dark-blue in color and not very painful. The patient squeezed it vigorously on several occasions in attempting to force the contents out. Finally he succeeded, the rupture taking place at the free border of the prepuce. A thick dark brown material was discharged. The sac soon refilled. One month prior to coming to the hospital, a physician made a small incision at the summit of the swelling. A discharge of pus was said to have occurred. Examination showed a firm ovoid mass apparently attached to the corpus cavernosum having, at its summit,

Fig. 3.



Cyst of sheath of penis.

a crater-like depression, where the small incision had been made. During the succeeding night the sac ruptured at this point and the contents were lost in the dressings. In consequence, at the time of operation, the mass was found considerably reduced in size. The probable nature of the contents was not recorded. An elliptical incision was made and the sac everywhere carefully dissected out and trimmed off down to its floor, which seemed to blend with the fibrous sheath of the corpus cavernosum. No attempt was made to remove the floor because of the risk of producing a contracting scar in the sheath of the corpus cavernosum. The floor was thoroughly scraped with a sharp curette and the skin brought together over it. Primary union was obtained except at one angle from which a scanty serous discharge took place until after a few injections of a stimulating silver nitrate solution. When last seen the patient said erections occurred without pain or curvature and that he could now cohabit with comfort. His chief complaint has been that because of the mass he had not been able to cohabit. The walls of the sac, which were about one-eighth of an inch thick, were examined and found to consist of dense fibrous tissue.

An Unusual Case of Peri-urethral Abscess.—Dr. Howard Lilienthal presented this patient, a man, thirty years old, who had been sent to his service at the Mt. Sinai Hospital February 22. When he entered the hospital his principal complaint was pain and induration in the testicle. His family history was negative. He had gonorrhea eight years ago and this was accompanied with joint swelling and other symptoms for two months and an intercurrent attack of pneumonia. He had a gonorrheal discharge for seven months and then it ceased. His present illness began with his second attack of gonorrhea which he had last February. Three weeks before admission he noticed a swelling in the midline of the penoscrotal junction which was hot and tender. He had also a certain amount of chordee. One week before the operation he had this abscess incised by Dr. Goldenberg. A careful examination of the pus by culture and spread showed it to be sterile. On admission his purulent discharge from the urethra did not contain gonoccocci. The mass at the penoscrotal junction was indurated, and was about 5 cm. in diameter extending to the left side. At its center was a sinus through which a probe could be passed for a distance of about six or seven inches upward into the left groin. No organisms could be found by culture or spread from the discharge from the sinus. The upper pole of the epididymis was tender and enlarged. The inguinal glands on the left side were more enlarged and tender than on the right. Operation was performed on November 28. This patient had been thought to be tuberculous and had been given an iodoform-glycerine emulsion by injections which did him no good. The reason he was thought to have tuberculosis was because no findings by culture or spread were obtained. He opened the left tunica vaginalis but he did not find it necessary to go far up into the groin because the channel had partly closed. He had great difficulty in tracing the pus to its source but finally succeeded after a very extensive operation; it was in the neighborhood of the urethra near the penoscrotal junction. By the aid of retractors he opened down to the bottom and scraped it out thoroughly and packed it with iodoform gauze. A very amusing incident occurred at the time of operation. There were a great many indurated masses in the tract and, wondering what the disease was, the doctor excised some of the yellow granular deposits with the idea that the case might be one of actinomycosis. When he recalled the injections of iodoform-glycerine emulsions these deposits were explained. There was so much of the tunica vaginalis involved that he removed the thickened portion and left the testicle pretty well uncovered. It was noted that on March 18 the discharge from the urethra continued but no organisms were found in it. On April 2 the sinus was curetted and packed with iodoform gauze. April 10 there was no discharge from the urethra although the patient was still receiving urethral irrigations. The patient was in the hospital at present being treated for a small sinus which persists and may have to be again curetted.

Dr. Ferd. C. Valentine asked if it was Dr. Lilienthal's experience, dealing with peri-urethral abscesses to have fistulæ remain, especially in those cases which resulted from breaking down of infiltrated glands. At present he had several such cases. In these he used the Kollmann galvanocaustic needle to destroy the cicatricial tissue which lined the fistulæ; adhesions then formed and no disagreeable results supervened. He referred only to those smaller fistulæ which connect with the urethra and whose extent was too small to warrant plastic operation.

Dr. F. Tilden Brown asked Dr. Lilienthal where the starting point of this sinus was situated and also what was the probable etiology of the condition.

Dr. Howard Lilienthal said that he had seen fistulæ which were said to be the result of peri-urethral abscesses and he had operated upon them, but it had been his fortune thus far not to have had fistula result in any case that he had operated upon. Still they continued to come into the hospital with fistulæ. Rather than to evacuate the abscess into the urethra he thought it better to open it early from the outside for the reason that these fistulæ occur on account of the necrosis of a considerable part of the mucous membrane of the urethra itself and these fistulæ were more likely to occur if you allowed them to break spontaneously into the urethra. He advised operating from without so soon as you are sure that you are dealing with a peri-urethral abscess. Of course there will be a minute opening between the urethra and the abscess cavity but that will take care of itself.

He said that the origin of this abscess was at the penoscrotal junction and originated in all probability from a peri-urethral abscess gonorrheal in character.

Dr. John Van der Poel said that in five or six cases of peri-urethral abscess he had been unable to find gonococci or other bacteria in the pus. In each of these instances by means of the endoscope he had been unable to find any trace of an urethral opening to the abscess, but in other cases when there was a urethral sinus, gonococci had been found in the pus passed from the abscess cavity into the urethra, and collected in the endoscopic tube.

Rupture of the Urethra.—Dr. J. A. Bodine reported the history of a man, fifty-six years old, who had sustained subcutaneous rupture of the urethra as the result of falling astride an iron beam. He felt dazed for a time, but resumed his work. He noticed moisture at the meatus and on examination found blood issuing. He went to Long Island City and called his physician. There was no desire to pass water, although the patient was sure he had not urinated since early in the morning. His physician wisely attempted no instrumentation except to pass a soft catheter which stopped at the membranous urethra. Patient was sent into St. John's Hospital the evening of the same day and operated upon eleven hours after the accident. Blood was flowing from the meatus and a scrotal hematoma the size of a fetal head existed. The perineum was distended, fluctuant and ecchymotic. A sound introduced through the meatus was arrested in the membranous urethra, its tip lying just under the skin of the perineum. Incision through the skin showed the muscles to be extensively lacerated and torn. There was considerable active bleeding, which was easily controlled. No infiltration of urine had occurred, though the bladder was very much extended. There was no deep urethra present. A finger could be passed directly up to the subpubic arch. The torn proximal end could not be readily found, though little time was spent in its search as the distended bladder above the pubes offered such an easy and rapid method of identification by a suprapubic puncture and retrograde catheterization. The segments of torn urethra were identified, and as they could be approximated without tension, were sewn together around a soft catheter, introduced through the meatus. The perineal wound in the muscles was left open and packed with gauze. The suprapubic wound was sutured, both the bladder and abdominal wall, except its lower angle, through which issued a silk thread the other end passing through the eye and lumen of the catheter out of the meatus. The bladder was drained through the urethra for ten days. Daily withdrawal, sterilization and reinsertion of catheter being practised. Primary union of urethra occurred and the patient left the hospital in four weeks. No leakage of urine through perineal wound could be detected. A No. 30 French sound passes without any inconvenience, the urinary and sexual functions were perfect. The inducement to do suture of the entire circumference of the urethra around the catheter in an effort to secure primary union were the absence of any urinary extravasation in the perineum and the lack of tension when the torn urethra was approximated. He emphasized the value of suprapubic puncture with retrograde catheterization as the easiest and quickest method of identifying the proximal end of the torn urethra.

Dr. Howard Lilienthal believed that the suprapubic operation was the only thing to do in such a case. He had seen valuable time wasted in attempts to reach the posterior urethra when it could be readily managed by making a suprapubic opening. He thought Dr. Bodine would have taken fewer chances had he drained the bladder through the suprapubic wound.

Dr. F. Tilden Brown reported a case seen two weeks ago which demonstrated the utility of the suprapubic opening. During the operation he wished to have a leading thread in order that he might introduce a larger catheter. After he had made his suprapubic incision a soft catheter was passed through the proximal section of the urethra; the distal or eye-end of the catheter in the bladder had passed over it a loop of silk. He expected to use this silk thread to bring a larger catheter in. This was deemed important because of the existence of a tight stricture in the anterior urethra and because the rupture was the result of the necrotic state of the membranous urethra secondary to extravasation of urine; there were present numerous fistulous tracts also. This man passed his urine through the perineal opening and since operation he has been able, by the aid of vision and touch, to pass a sound into the posterior urethra. The first time he attempted this the vesical end was well out of sight and it was difficult to see whether the point of the sound traveled the proper course. To act as a safeguard he passed a curved catheter into the perineum.

Dr. Pedersen said that formerly much damage had been done by overzealous attempts to pass a catheter. It was reassuring to note that a better understanding of these cases was becoming established among practitioners in general. In these cases the urethra should not be explored until preparations for operating had been completed, and the operation should be undertaken as soon as possible.

Dr. J. A. Bodine said that the suprapubic wound was closed by suture, except its lower angle. The attachment of a silk string to the end of the catheter in the bladder bringing the other end of string out of the open lower angle of suprapubic wound insured an easy and safe reinsertion when the catheter was withdrawn for sterilization. He asked the members present if they frequently had delirium associated with suprapubic operations on the bladder. Delirium followed in this case and he thought it was due to absorption of urine through the wounded surfaces, though the wounds were clean and there was no escape of urine through the perineal section. The quantity of urine and percentage of urea were normal. It had been his experience that delirium followed the suprapubic incision into the bladder in many cases. He recalled this annoying symptom in four prostatic operations where the incision had been made above the pubes.

Dr. Howard Lilienthal said he had performed many suprapubic operations for various reasons and had had only one case in which delirium occurred; this patient

had a severe hemorrhage and was septic and it was natural that delirium should follow. He had seen two cases of delirium following the suprapubic operation for stone. One terminated fatally, the other not. He could not explain the delirium occurring in Dr. Bodine's cases. He believed the suprapubic operation to be simpler than the perineal.

Regarding the thread he used silk thread that had been been dipped in compound tincture of benzoin; this made it not only aseptic but holds knots fast as well as rosin would.

Dr. F. Tilden Brown believed that it would have been a mistake to use an unreasonable ligature material in this patient because, unless the parts were kept open, the silk ligature would serve for granulations to grow upon. He preferred chromicized catgut to silk.

Dr. John Van der Poel said he had seen one case of delirium following suprapubic operation for stone. In this case there was a purulent bronchitis and considerable temperature following the use of ether. The delirium abated with the subsidence of the bronchitis and its accompanying fever.

Dr. F. Tilden Brown said that he believed a person could have a low grade cystitis following a urethritis contracted some time prior to the suprapubic operation, without any micro-organisms being present except those that were considered to be normal, and without any urinary symptoms at all. In such an instance he would not be surprised to find, upon opening into the cellular tissues about the bladder, some evidences of constitutional disturbance due to absorption, not of high grade, but a low septic process.

The Treatment of Acute and Subacute Anterior Gonorrhea by Retrograde Injections of Stronger Solutions of Silver.—Dr. Hermann G. Klotz read this paper. The principal features of this paper were published last summer in Vol. LXII of the *Archiv für Dermatologie*. From previous experiences with irrigation of the anterior urethra with solutions of bichloride of mercury, nitrate of silver, permanganate of potassium, etc., he had become convinced that the mucous membrane showed much less irritation subjective and objective when such solutions were allowed to flow through the urethra in a retrograde direction, that is, from the bulbus to the meatus, than when administered in the contrary direction from the meatus to the bulbus. The syringe he used for his injections was a somewhat enlarged edition of the old Braun's intra-uterine syringe; the opening in the tube was located in the side of a bulb at the end of the syringe, so that the fluid was not easily projected beyond this point of the syringe itself. Lubricated with the injection fluid (protargol, argonin, albargin) or some other lubricant, the point of the tube was carefully inserted within the orifice and quickly passed down to the bulbus, when the syringe was slowly emptied of its contents. The fluid was retained within the canal for two minutes or more. Eight or ten hours after the injection the patient should begin injections of some of the common antiseptics or astringent solutions. After four or five days the silver injections should be repeated and, at this time, the condition of the urethra warrants a stronger solution. Treatment was continued in this manner until the discharge disappeared when all injections were finally discontinued. Toward the end of the injections the test with beer or whisky was allowed. Whenever after a reasonable number of injections a cure or decided improvement had not been effected, an endoscopic examination would usually reveal some local condition which would explain the persistence of the trouble and require stronger local remedies. He next considered the question, under what conditions a gonorrhea might be considered cured. He believed that a cure should be conceded if the discharge and gonococci had entirely disappeared and did not return after all treatment had been discontinued for several weeks and the patient had resumed his usual mode of living, particularly in regard to sexual intercourse and alcoholic habits. As a symptom of the greatest importance he closely watched for the disappearance of every trace of cloudiness from the first portion of the urine, particularly of the morning urine even though some threads or filaments might remain. He did not think it was possible in all cases to remove these threads; the efforts to accomplish this object often did more harm than good, he did not believe the presence of these filaments were in the least injurious to the men themselves nor to the women with whom they had sexual intercourse, even though there be present a small number of pus cells beside epithelia, provided there were no gonococci found on repeated examinations.

From a previous experience in subacute cases he was ready to follow Von Sehlen's example, adopting his principles, but with some modifications. Instead of using the ordinary syringe he employed the one above referred to, so as to place the silver solution as far as possible beyond the infected region of the urethra, in recently infected cases about three inches from the meatus, in the more advanced ones as far as the bulbus. He did not think there was danger of carrying active gonococci into the deeper portions of the urethra. After removing the syringe he followed Von Sehlen's method. He first used solutions of nitrate of silver from one-tenth, later usually one-eighth per cent. and higher concentrations. Where the inflammation was very intense and the mucous membrane very sensitive he occasionally resorted to thallin in seven per cent. solution. Of the various organic silver preparations he had had experience with argonin, protargol, less so with ichthargan and argentamin. Since 1901 he had become very well satisfied with albargin, and later experience had confirmed the favorable opinion of this drug, which was expressed in a paper published last fall (MEDICAL NEWS, Nov. 29, 1902). Argonin had been employed up to 10 per cent., protargol 2 per cent. to 4 per cent., albargin 1 per cent. to 5 per cent., ichthargan up to 2 per cent., argentamin (more in the later stages) from 5 per cent. to 10 per cent. equal to one-half per cent. to 1 per cent. nitrate of silver. He said that all the newer remedies caused an increase in inflammation and secretion, furnishing a more favorable condition for the development of the gonococci; therefore, he deemed it advisable to use some gonococcidal injection only at stated intervals to avoid cumulative irritation; in the interval, he administered astringent and antiseptic solutions, and the following was his favorite, and which he designated briefly as the B.P.Z. Injection:

℞ Boric acid	1.5	grams (24 grains).
Acetate of lead, Sulphate of zinc, of each	75	centigrams (12 grains).
Glycerin	4	grams (1 dram).
Water	120	grams (4 ounces).

M.S.

In general his experience had been that cases of gonorrhea which came under treatment soon after infection and immediately upon the appearance of the symptoms, were permanently cured within a few, six to eight, days. In other cases he did not succeed in removing the cocci, but the symptoms were quickly reduced to such a degree that the patients hardly experienced any trouble except that immediately connected with the treatment, and all graver complications were

avoided. The earlier the treatment was begun the more successful would it be. When a patient presented himself for treatment on the appearance of the first symptom, say four to seven days after infection in primary cases, thirty-six hours to three or four days in reinfected ones, after emptying the bladder, an injection of some silver solution is immediately made in the concentrations of one-eighth to one-fourth per cent. of the nitrate of silver, 2 per cent. of protargol, 1 per cent. of albargin, etc. This was deposited three or four inches from the meatus. A second injection was made of a stronger solution if the first did not cause any burning. After removing the syringe the fluid was so manipulated that it was distributed as much as possible over the mucous membrane. If the patient called in the morning he was advised to take the B.P.Z. solution before his evening meal and at bedtime. The next morning he received his second injection of silver and again on the third day, the B.P.Z. injections being repeated as on the first day. On the fourth day the astringent injections were repeated three times, on the fifth was given a silver injection, then the B.P.Z. injections were continued for forty-eight hours and, on the eighth day, after twenty-four hours' intermission of all treatment, another silver injection was made. Should the symptoms continue after the seventh or eighth day the silver injections should be continued at intervals of three or four days, as in the subacute cases. In the later stages he preferred nitrate of silver to the organic silver preparations.

Dr. George K. Swinburne said that he was almost entirely in accord with all that had been stated by the reader of the paper. Any one who had treated this disease must work out his own method. He had used in the past retrojections, but he now preferred other methods. He was glad to hear Dr. Klotz say what he did regarding the threads occurring in the urine in these patients; many of these individuals spend their entire time examining their own urine looking for these flakes, which they consider to be the disease itself. These flakes could be proven to be non-contagious. One could make the urine clear up after a week or ten days, but these threads would very soon return.

He said he had been for many years now observing the effects of treatment in cases of acute gonorrhea, more so than in the chronic cases. He first began in 1888 with Dr. Brewer, and learned his method of hot retrojections of bichloride at the Vanderbilt Clinic. When he came to have a clinic of his own he started in to study the disease itself, giving patients placebos. In order to make his studies complete, and to learn the value of internal medication, every other patient received some supposedly antigonorrheic mixture, the alternate patient receiving the placebo. The results obtained in both treatments were practically alike. In some cases the discharge ceased, after a longer or shorter time; in others it went on to a chronic condition. Before this he had found that, in using ordinary urethral irrigation of bichloride, the bladder could be irrigated from the meatus without a catheter; this was in 1888. Then he made further studies, stopping all internal medication, and tried local treatment with nitrate of silver in dilute solution at first and gradually increasing them. Later the two-per-cent. solutions were tried as an abortive means, but found to be too irritating and to be especially disastrous in primary cases. He then took up the permanganate of potassium irrigations, irrigating with a fountain syringe. He then tried argonal, then protargol, albargin, and other preparations. Of late he had been using exclusively the new salt of silver, argyrol, because it was entirely non-irritating, no matter what the percentage used. There was no question regarding the valuable results he had obtained with this drug.

He had seen a large number of primary cases early in the disease, and only during the past winter forty primary cases were under his care at one time, all being primary cases of gonorrhea, and they came to him during the first week. Of this forty, twenty came within forty-eight hours, and fifteen within twenty-four hours after the beginning of symptoms.

A great many cases stop treatment when the discharge stops and remain away until the discharge returns; therefore, when they return, the disease has invaded deeper portions of the canal, the urethral follicles may be involved, abscesses may form, epididymitis may develop, etc., all due to the fact that the patients stop treatment too soon, because of their ignorance of the disease.

Dr. James Pedersen said that he was familiar with the method of treatment by retro-injections, as applied to subacute and chronic urethritis, but he preferred to call them *instillations*. He was, however, opposed to the stronger solutions of silver nitrate, fearing the after-effects which the delicate mucous membrane of the urethra must receive from a two-per-cent. silver nitrate solution. He preferred the milder solutions, although the course of treatment was thereby prolonged. He believed that the ultimate result as to a cure was as good, and that the more remote effect upon the mucous membrane would be even better than when the stronger solutions were used.

Time and again, when making an endoscopic examination of patients who had come to him suffering from chronic urethritis, he had been struck by the cicatricial appearance of the urethra in general and of the anterior two or three inches in particular. Enquiry had always developed the fact that these patients had used or had been given an irritating injection—one that had caused a subsidence of the discharge very quickly, but had given rise also to considerable burning when in contact with the urethral mucous membrane. He recently had the opportunity of inspecting a urethra which had been the seat of repeated severe attacks of urethritis. This patient had refused local treatment for some reason, and had simply treated himself on the expectant plan. Endoscopic examination showed a practically normal urethral mucous membrane. Dr. Pedersen pleaded for the use of milder solutions, even though the treatment required a longer time to effect a cure, meaning by "cure" the restoration to a condition in which the patient may be conscientiously allowed to marry.

Dr. Ferd. C. Valentine said that it was not clear to him how retrograde injections could produce less objective and subjective symptoms than those conventionally employed. Persistently advocating, as he does, the irrigation treatment of gonorrhea, it seemed to him that the entrance of fluid into the urethra and the flow therefrom, by carefully administered irrigations, could under no circumstance produce objective or subjective disturbances. It seemed to the speaker a violation of surgical principles to introduce any rigid instrument into an inflamed area, especially an area so sensitive as the urethra. The speaker further asked the author whether one of the claims he made for the instrument was not really an objection to it, namely that the fluid carried by the instrument into the urethra could not be projected beyond its acorn. This, it appeared to the speaker, would inevitably carry before that acorn the elements of disease, and would distribute them along the regions not yet infected. Dr. Valentine said that in the light of his experience whisky was by no means as reliable an irritant as beer and carbonated beverages,

with which to demonstrate the presence of gonococci in apparently cured cases. He referred, in this connection, to another one of Dr. Klotz's brilliant papers, in which the author had shown how severely irritating to the urinary apparatus the use of carbonated drinks can become. On the contrary, even the abuse of whisky does not, in the speaker's experience, exercise such an irritating influence upon the urethral mucosa as do carbonated beverages. In referring to the proofs of cure, the speaker took exception to von Zehlen's statement that if the discharge ceases and the patient resumes his usual mode of living, and had no recurrence of the discharge within three weeks, then the patient was to be considered cured. The speaker pointed out the large number of men who are apparently cured from gonorrhea, and even years later infect their wives. Dr. Valentine insisted that in no case should a physician consent to a patient's marriage until the beer-test, irritation of the urethral mucosa with injections of nitrate of silver or mercuric bichloride, interrogation of the prostate and seminal vesicles, urethroscopy, and finally the condom-test had proven him to be absolutely free, as far as modern science allows us to decide, from ability to infect with gonococci. Even then, wisdom demands repeated examinations of urine passed perfectly clear, both microscopically and by cultures to prove that the urine does not carry gonococci from some part of the genito-urinary apparatus. In speaking of the retrograde injector from its mechanical viewpoint, he could not but felicitate Dr. Klotz upon the ingenious improvements he had made in the instrument; but he insisted that a retrograde flow of whatever medicating fluid was employed, he must adhere to the far greater value and safety of irrigations, which do not entail the introduction of any instrument into the acutely inflamed urethra. Dr. Valentine agreed with Dr. Pedersen regarding the keratosis of the urethral mucosa, which is often found after strong drugs have been injected into the channel. Regarding the use of drugs in irrigations, experience had taught him to vary them, while he still placed greatest reliance upon potassium permanganate irrigation. In concluding he referred to the possibilities of there being various forms of gonococci, some yielding to irrigations with one drug, others to irrigations with other solutions.

Dr. William J. Brunner said he was impressed with the short time required to effect a cure. It seemed to him that experiences of most men were contrary to that statement. Not only in private practice, but in hospital and dispensary practice the cases ran three, four, five, six or seven weeks, and even then one could not be sure of a cure being effected. Again he believed the character of the patients under treatment had much to do with the course of the disease, *i.e.*, their mode of life had much to do with the ultimate results of treatment. It was the experience of many that the so-called cures later found their way to other doctors.

Dr. Frederic Bierhoff fully realized that so long as there were several men working along one line of work in this specialty, there would be several methods of treating the same disease. At present he adhered to the irrigation method, as opposed to the instillation and injection methods. He had not had any opportunity of using and testing the method advocated by Dr. Klotz. He agreed with the statement that the sooner we began treatment of gonorrhea the better it would be for the patient, and the greater the chances for cure. Personally, he had had some experience with the so-called abortive treatment, the treatment advocated by Frank, of Berlin, and others, and he was perfectly satisfied with it. In some instances after but one application, when the patients present themselves within twenty-four hours after the suspicious intercourse, the gonorrhea would disappear and remain away. In other cases though, that presented themselves within a few days after the suspicious intercourse, the gonococci have disappeared after one application of the irrigation treatment advocated by Levine, the gonococci remained absent and the patients had been absolutely free from any discharge within forty-eight or seventy-two hours, and remained so even after the most rigid tests. In cases of subacute gonorrhea he had obtained satisfactory results from the irrigation treatment, employing the modern gonococcicide drugs. It was his experience with the use of these drugs in gonorrhea that where the gonococci persisted after the eighth day of treatment he would have to deal with inflamed glands, with prostatic involvement, etc. In a fairly large proportion of cases with clear urine it was his experience to find gonococci in the prostatic secretion. He thought it stood to reason, where such conditions were present, that the irrigation or instillation of drugs could not be of service in curing these patients. They must be treated by different methods. If there was any danger at all, there was danger in the too great tendency to schematize. When recurrences occurred he thought it was due to insufficient treatment. If the prostate was involved, he believed it was due to a pre-existing condition of congestion of posterior urethra and prostate. The patients should be instructed that when the gonococci were removed and remained away, and the discharge had been entirely removed, if there were minute filaments present in the first urine, and they were found to be composed of mucus or fibrous shreds, with epithelia and isolated leucocytes perhaps, there was no danger whatever. If there were present, however, a large percentage of leucocytes it meant involvement of the glands and then, as a rule, the proper treatment would remove them.

Dr. Walter C. Klotz said he had employed this treatment during the past year in 200 cases of gonorrhea and, judging from the records of these cases, the results had been very satisfactory. Although the solutions used were stronger than those recommended by other authors, the patients had rarely complained of severe burning or irritation. In only 5 per cent. or 6 per cent. of all cases had inflammation extended to the posterior urethra and only a few of the latter cases developed epididymitis during the course of the treatment. The time of treatment was comparatively a short one. In some of the cases with primary attacks, the results were somewhat disappointing. In all cases the subjective symptoms were greatly relieved and the discharge much diminished.

Dr. B. Lapowski said that he knew of no one method for stopping the discharge in urethritis of specific origin. The trouble was not so much in stopping the discharge in those patients who wished to get married, but to get rid of the filaments that were present in the urine. The important point to remember was that the urine was not clear, and the question then comes up, "Are there any gonococci in that urine?" Any method that can rid these patients of the gonococci is the right method, and any method that fails in this object is the wrong method. He asked why it was impossible for us to state positively that the prostate was unaffected, and that there were no gonococci present, even in those cases in which the urine is clear? When the prostate is affected he asked how one could arrive at the conclusion that such was the case? He said we could never reach the lateral portion of the prostate for purposes of examination, because it was embedded in the rectum and, if that portion was affected there was the seat of the disease and there were the gonococci. The

prostatic epithelial cells were linked; between the prolongations of the cells the fibers and muscles go in. When the muscle contracted the cells contracted to expel the pus, but the muscles were never contracted to such a degree as to expel the gonococci which were in the cells. He related the instance of a patient, seen by him eighteen months ago, who gave no gonorrheal history. In the semen there were no spermatozoa. There was a clear discharge of fluid, which he could not tell whether it was prostatic or not. He asked for a specimen obtained after coitus. In natural coitus he said the muscles would contract nicely and press out the contents of the prostate; but when the coitus was not natural the contents would not be pressed out. This he considered to be a very important point. If such a patient married the following day often the gonococci would show themselves. He said that one should not forget the fact that there were other cocci present which looked like the gonococci and stained with Gram's stain and which were diplococci. Therefore, when one examines such a patient and finds something which looked like the gonococci and took the Gram's stain, often the conclusion was jumped at that it was gonorrheal. Some of these cocci were anaerobic and others aerobic.

He did not believe, as had been stated, that there were different kinds of gonococci, although they might act differently. One might be grown by agar-agar cultures and another might grow upon serum cultures. If a gonococcus be taken which had no vitality and placed in agar-agar serum for a long time, we may get a plain culture. A gonococcus may be had from a woman which has no vitality; and when transplanted to new soil it may develop. He believed that if we left the patients alone, only tending to the cleansing and keeping the parts at rest, we may hope that Nature itself will do something for the gonococci without our further help.

Dr. T. M. Townsend said that the larger number of gonorrheas he had observed, had readily extended to the prostate. He, therefore, could not speak favorably of retrograde injections of the anterior urethra. He believed from many clinical observations, that the selection of the medicament formed a potent factor in the rapid cure of the disease. He observed rapid and satisfactory results from intravesical irrigations of silver salts, especially albargin 1 to 2,000 following massage, in subacute follicular prostatitis, and concludes that this agent is of most service when gonococci becomes scanty and individual. Argyrol had not given him the results which its preliminary reports promised, though it proved the least irritating of the remedies that are offered as gonococcides.

SOCIETY OF ALUMNI OF BELLEVUE HOSPITAL.

Meeting of May 6, 1903.

The President, Robert T. Morris, M.D., in the Chair.

Left Nephrectomy and Right Nephrolithotomy on the Same Patient.—Dr. John F. Erdmann reported this case, and exhibited the patient showing the long vertical incision for the former, and the long oblique incision for the latter operation. The patient was thirty-one years of age, had been married fourteen years and had suffered several attacks of colicky pain, the last one being severe and characterized by a pain radiating to the side and extending down to the genitals. The patient had previously passed several small calculi. On incision of the transversalis fascia eight ounces of turbid, semi-purulent fluid escaped. The cavity was washed out with normal saline solution. Each operation took about forty minutes. Twenty-one small stones, weighing five grains, and one large one, weighing three drams, were removed from the pelvis of the kidney. An X-ray photograph taken by Mr. Caldwell showed the position of the calculus. Convalescence was assured after the first day. The chemical analysis, made by Prof. Mandl, showed an excess of uric acid and small quantities of calcium and magnesium phosphate.

Notes on Torticollis.—Dr. L. W. Hubbard presented this paper. He said that in considering the question of torticollis from the surgical standpoint it must be looked upon, not as a matter of life and death, but as a condition demanding relief because of the deformity. Torticollis might be defined as a contraction of certain muscles, usually the sternomastoid, but sometimes other muscles, along with the fascia and subcutaneous tissues. There was much difference of opinion expressed in the literature as to the frequency of torticollis. The two chief varieties were the congenital and the acquired. Out of 500 cases, seen at the Hospital for Ruptured and Crippled, 87 were congenital, a fact which seemed to bear out the author's opinion that there was a much larger proportion of congenital cases than was generally supposed. For some time Stromeyer's theory as to the cause of this form had been accepted, *i.e.*, that a rupture of the affected muscle occurred during delivery, most of these cases being breech presentations, but at the present time the prevailing opinion was that the cause of torticollis was to be sought in some prenatal condition, such as inflammation of the muscle and fascia. The acquired form was conveniently subdivided into the acute, the chronic and the spasmodic variety. In some instances torticollis developed years after birth, making this condition analogous to clubfoot. The characteristic deformity was a turning of the chin *away* from the contracted muscle, a point of diagnostic importance, for, by its aid, one was enabled to differentiate torticollis from cervical Pott's disease. In the latter the chin turned toward the contracted muscle, and there were pain and muscular spasm. Certain forms of torticollis, due to rheumatism, enlargement of the cervical glands and other causes, yielded readily to treatment on the removal of the cause.

The treatment was worthy of careful consideration, though there seemed to be a reluctance to recognize the importance of early treatment. A case was cited in which a young girl with a simple curvature was treated unavailingly by means of exercises, with the result that there was marked deformity. These cases should be subjected to treatment as soon as diagnosticated. Up to the sixteenth century no treatment had been employed except splints. In 1639 the first operation for torticollis was performed; later on Dupuytren practised subcutaneous tenotomy, a method even now employed by some surgeons. In doing this operation the vessels and subcutaneous tissues were liable to be injured, and on this account Dr. Hubbard thought the open method was more scientific. He advocated making a linear incision of sufficient size to thoroughly expose the fascia and muscle, and then dividing every contracted tissue. Primary union generally followed, and only a slight scar was left. The head should be kept in proper position until union had taken place. It was better to do the operation under general anesthesia, but he had operated under cocain anesthesia. The first case operated upon was that of a woman of twenty-nine years in whom the deformity had existed since birth. In this case a portion of the trapezius muscle was affected. In another case, occurring in a girl of fifteen years, a perfect result was obtained. The postoperative treatment should consist of appropriate exercises continued for about one year.

Dr. William J. Chandler said that, judging from an experience of thirty years, he would say that torticollis

was a rare complaint. He recalled one obstinate case which had developed after measles, and had persisted for a year or two.

Dr. H. S. Houghton said he firmly believed in the existence of the congenital form of torticollis, and recalled the case of a child born with it in which the head was rotated to the left side. After having the child under observation for some time the case had been referred to an orthopedic surgeon, and was now wearing a brace coming up under the chin, in this manner correcting the deformity.

Dr. H. H. Seabrook spoke of eye torticollis, or "head tipping," a condition dependent upon paresis of the eye muscles, generally the superior rectus. He said that Stevens had attributed this condition to the image being focussed on the perpendicular plane. Of course, these cases were not true torticollis, and most of them were transient, the head being tipped only when the patient stopped to look at something. He had seen 365 such cases in the past three years, and thought orthopedic surgeons would do well to bear this in mind.

Dr. Hubbard, in closing the discussion said that when an early diagnosis was made operation was not necessary, other means proving sufficient for correction. The cases referred to by Dr. Seabrook were not examples of true torticollis, for at times the patient was able to hold the head straight, and they were usually relieved by appropriate treatment of the eyes. In true torticollis a downward position of the eyes persisted even after the deformity had been corrected.

Do Our Present Modes of Living Tend to the Increase of Certain Forms of Nervous and Mental Disorders?—Dr. C. E. Atwood, of White Plains, N. Y., read a paper with this title. That some forms of insanity were on the increase, the author said, he had first proved to his own satisfaction while preparing a paper on "The Teaching of Recent Investigation Into the Causation of Insanity," read before the Social Science Association in 1891. There was also no doubt that neurasthenia and some allied neuroses were also increasing, and the fact of this increase in nervous and mental disorders he attributed to our present methods of living. By this was meant our rapid and overstrenuous life, its varied and increasing demands upon us and the associated irregularities in eating, drinking and sleeping with a tendency to overindulgence. At first glance many might be disposed to take a pessimistic view of the effects of the present strenuous life, but a closer study of the facts would show that harm was only likely to result when the balance was not maintained by sufficient variety, rest and sleep. Whenever wear and tear were excessive and rest and repair deficient the result was bound to be disastrous, if not in the present, certainly in the next generation. All cellular activity required cellular rest. A nerve cell which had been subjected to five hours of artificial stimulation had been found to require twenty-four hours' rest in order to fully recover from the exhaustion and the changes induced by such activity. What took place in the cell when artificially stimulated probably occurred, to a less degree, in the mental and physical activities of daily life. The normal symptom of cell exhaustion, fatigue, was dissipated by rest and sleep, during which the blood current carried off most of the products and restored cellular activity. This brought up the question of auto-infection. The usual form of auto-infection was that produced by morbid alimentary action. There was, however, a more dangerous form, caused by incomplete oxidation of the products of the worn-out body cells. These products of suboxidation were called alexins. Anything which interfered with complete oxidation probably caused neurasthenia. The autotoxins would produce toxic effects upon the nerve centers. Some neurologists went so far as to say that all forms of insanity were caused by auto-intoxication, but most of them admitted that some varieties had their origin in tabes dorsalis, syphilis, epilepsy, convulsions in early life, etc. Most forms of insanity were due to neurotic and faulty tendencies and inheritance, either in the parents or grandparents, a fact frequently exemplified in cases of chorea and alcoholism. When one recalled the potential traits of the individual, and how each began in the germ plasm, there was little wonder concerning the profound influence of heredity. If normal products showed this influence, it was but natural that abnormal ones should bear evidence of it to a still greater degree. The speaker then referred to the increased per capita use of alcohol in the United States. He said that we were the most nervous people in the world, and that this was probably the result of our mode of life. Overwork did not cause neurasthenia unless it was accompanied by loss of sleep, drug addiction, excessive eating and drinking, etc., thus leading to arteriosclerosis and apoplexy. In 1892 the average age for the occurrence of apoplexy was 58.9 years; in 1902 it was 64.2 years. The brachiocephalic type was found in the cities, the dolococephalic type prevailing there. Mental derangements were increasing among negroes. In 1890 50 per cent. of the insane were of foreign-born parents and 30 per cent. were themselves foreign-born, the Russian Jews vastly predominating.

The number of cases of hysteria and neurasthenia had doubled. Alcoholic neuritis was three times more prevalent, and there was a slight increase in tabes and general paresis. The increasing dangers of our modern life could be offset by teaching hygiene and by change of occupation and securing needed rest. In the opinion of the speaker the "yellow journals" were responsible for a certain amount of crime and suicide. He suggested that the restriction of immigration in certain cases would result in a decrease of insanity.

Dr. Charles E. Quimby agreed with the author as to the probability that apoplexy was caused by a toxemia. The arterial change was not due to high tension but to cardiac, renal and arterial changes throughout the body, though more particularly in the brain.

Dr. Russell Bellamy thought the increased number of neurasthenics was attributable to sexual excesses and lack of segregation in the control of gonorrhea and syphilis; also to the sexes being thrown so closely together, for never before in history had men and women been brought into such close association. In olden times men worked in the field and the women stayed at home; now they worked side by side.

Dr. J. W. S. Gouley said that if he had understood Dr. Atwood correctly the statistics quoted regarding the use of alcohol applied to alcoholic beverages. He felt sure that a comparison of the statistics regarding the per capita use of such beverages in England, France, Germany and the United States would show that we were a very sober nation.

Dr. Seabrook said that the conclusions drawn from the State hospitals would be overthrown if compared with the statistics from private practice, for the foreign element predominated in public institutions. He pointed out that the Chinese and Japanese were a very nervous and dissipated people.

Dr. Atwood, in closing the discussion, said that he had not intended to be pessimistic on the question of alcohol. He then read a portion of an article reproduced from a papyrus six thousand years old, taken from a tomb of the fifth dynasty, in which the author deplored the deterioration of his age, and mourned the good times that had passed away.